OM-239 511P 2012–06

Processes

- Stick (SMAW) Welding
- MIG (GMAW) Welding
- Flux Cored (FCAW) Welding
- TIG (GTAW) Welding
- Air Carbon Arc (CAC-A) Cutting and Gouging

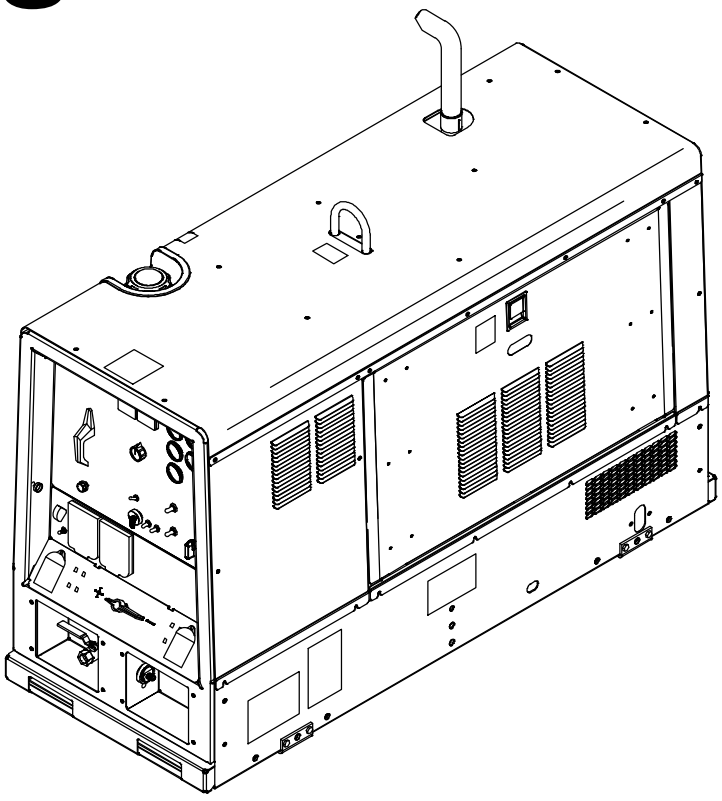
With Optional Equipment:

- Battery Charging

Description

Engine Driven Welding Generator And Air Compressor

Big Blue® Air Pak™



OWNER'S MANUAL

File: Engine Drive

Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller®

TABLE OF CONTENTS

SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING 1
1-1. Symbol Usage 1
1-2. Arc Welding Hazards 1
1-3. Engine Hazards 3
1-4. Compressed Air Hazards 3
1-5. Additional Symbols For Installation, Operation, And Maintenance 4
1-6. California Proposition 65 Warnings 6
1-7. Principal Safety Standards 6
1-8. EMF Information 6
SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION 7
2-1. Signification des symboles 7
2-2. Dangers relatifs au soudage à l'arc 7
2-3. Dangers existant en relation avec le moteur 9
2-4. Dangers liés à l'air comprimé 10
2-5. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance 11
2-6. Proposition californienne 65 Avertissements 13
2-7. Principales normes de sécurité 13
2-8. Informations relatives aux CEM 13
SECTION 3 – DEFINITIONS 14
3-1. Additional Safety Symbols And Definitions 14
3-2. Miscellaneous Symbols And Definitions 15
SECTION 4 – SPECIFICATIONS 16
4-1. Weld, Power, And Engine Specifications 16
4-2. Air Compressor Specifications 16
4-3. Sound Level Table 16
4-4. Dimensions, Weights, And Operating Angles 17
4-5. Generator AC Power Curve 17
4-6. Stick And MIG Volt-Ampere Curves 18
4-7. TIG Volt-Ampere Curves 19
4-8. Fuel Consumption 20
4-9. Duty Cycle And Overheating 20
4-10. Optional 3-Phase Generator Power Curves 21
4-11. Air Compressor Output Curve 22
4-12. Optional Battery Charging Output Curve 22
SECTION 5 – INSTALLATION 23
5-1. Serial Number And Rating Label Location 23
5-2. Installing Welding Generator 23
5-3. Mounting Welding Generator 24
5-4. Grounding Generator To Truck Or Trailer Frame 25
5-5. Installing Exhaust Pipe 25
5-6. Connecting The Battery 26
5-7. Using The Optional Battery Disconnect Switch 26
5-8. Engine/Compressor Prestart Checks 27
5-9. Connecting To Weld Output Terminals 28
5-10. Connecting Weld Output Cables 28
5-11. Selecting Weld Cable Sizes* 29
5-12. Connecting To Remote 14 Receptacle RC14 30
5-13. Connecting To The Air Compressor 31
SECTION 6 – OPERATING THE WELDING GENERATOR 32
6-1. Controls (See Section 6-2) 32
6-2. Description Of Controls (See Section 6-1) 33
6-3. Process/Contactor Switch 34

TABLE OF CONTENTS

6-4. Using Remote Voltage/Amperage Control 35
6-5. Fuel/Hour Gauge Descriptions 36
6-6. Optional Air Dryer Operation 37
SECTION 7 – OPERATING AUXILIARY EQUIPMENT 38
7-1. Domestic Auxiliary Power Receptacles 38
7-2. Connecting To Optional AC Power Plant 39
7-3. Export Auxiliary Power Receptacles 40
7-4. GFCI Receptacle Information, Resetting And Testing 41
SECTION 8 – OPERATING OPTIONAL BATTERY CHARGER 42
8-1. Battery Charging Guidelines 42
8-2. Determining Battery Charging Current 42
8-3. Connecting Uninstalled Battery To Battery Charge Output Terminals 43
8-4. Connecting Installed Battery To Battery Charge Output Terminals 44
8-5. Battery Charge Controls 45
8-6. Battery Charging Procedure 46
8-7. Jump Starting Procedure 47
SECTION 9 – ENGINE/GENERATOR MAINTENANCE 48
9-1. Engine Maintenance Label 48
9-2. Routine Engine/Generator Maintenance 49
9-3. Operating Optional Oil Pan Heater 50
9-4. Checking Generator Brushes 50
9-5. Servicing Engine Air Cleaner 51
9-6. Inspecting/Cleaning Optional Spark Arrestor Muffler 52
9-7. Engine Speed Adjustment 52
9-8. Servicing Engine Fuel And Lubrication Systems 53
9-9. Engine/Generator Overload Protection 54
9-10. Removing Optional Air Dryer For Service 55
SECTION 10 – AIR COMPRESSOR MAINTENANCE 56
10-1. Air Compressor Maintenance Label 56
10-2. Routine Air Compressor Maintenance 57
10-3. Servicing Compressor Air Cleaner 58
10-4. Compressor Overload Protection 59
10-5. Servicing Air Compressor 60
10-6. Adjusting Compressor Air Pressure 61
SECTION 11 – TROUBLESHOOTING 62
11-1. Troubleshooting Tables 62
SECTION 12 – CIRCUIT DIAGRAM 66
SECTION 13 – AIR COMPRESSOR DIAGRAM 68
SECTION 14 – RUN-IN PROCEDURE 69
14-1. Wetstacking 69
14-2. Run-In Procedure Using Load Bank 70
14-3. Run-In Procedure Using Resistance Grid 71
SECTION 15 – AIR COMPRESSOR TABLES 72
15-1. Flow Of Free Air (CFM) Through Orifices Of Various Diameters 72
15-2. Approximate Air Consumption (Cubic Feet) To Operate Pneumatic Equipment At 70-90 P.S.I.G. . . 73
SECTION 16 – GENERATOR POWER GUIDELINES 74
SECTION 17 – SELECTING AND PREPARING A TUNGSTEN FOR DC OR AC WELDING 81
SECTION 18 – GUIDELINES FOR TIG WELDING (GTAW) 82
SECTION 19 – PARTS LIST 84
WARRANTY

SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING

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Protect yourself and others from injury — read, follow, and save these important safety precautions and operating instructions.

1-1. Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

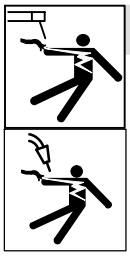
This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-7. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.



ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

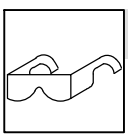
- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install, ground, and operate this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground — check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring — replace cord immediately if damaged — bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal. Disconnect cable for process not in use.

SIGNIFICANT DC VOLTAGE exists in inverter power sources AFTER stopping engine.

- Stop engine on inverter and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

BUILDUP OF GAS can injure or kill.

- Shut off compressed gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare, and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 and AWS A6.0 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

CYLINDERS can explode if damaged.

Compressed gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder — explosion will result.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1-3. Engine Hazards

BATTERY EXPLOSION can injure.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables, battery charging cables (if applicable), or servicing battery.
- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles unless the unit has a battery charging feature designed for this purpose.
- Observe correct polarity (+ and –) on batteries.
- Disconnect negative (–) cable first and connect it last.
- Keep sparks, flames, cigarettes, and other ignition sources away from batteries. Batteries produce explosive gases during normal operation and when being charged.
- Follow battery manufacturer's instructions when working on or near a battery.

FUEL can cause fire or explosion.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank — allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.
- Always keep nozzle in contact with tank when fueling.

MOVING PARTS can injure.

- Keep away from moving parts such as fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Stop engine before installing or connecting unit.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting engine.
- Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.
- Block flywheel so that it will not turn while working on generator components.

EXHAUST SPARKS can cause fire.

- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas — see applicable codes.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

STEAM AND HOT COOLANT can burn.

- If possible, check coolant level when engine is cold to avoid scalding.
- Always check coolant level at overflow tank, if present on unit, instead of radiator (unless told otherwise in maintenance section or engine manual).
- If the engine is warm, checking is needed, and there is no overflow tank, follow the next two statements.
- Wear safety glasses and gloves and put a rag over radiator cap.
- Turn cap slightly and let pressure escape slowly before completely removing cap.

Using a generator indoors CAN KILL YOU IN MINUTES.

- Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.
- NEVER use inside a home or garage, EVEN IF doors and windows are open.
- Only use OUTSIDE and far away from windows, doors, and vents.

BATTERY ACID can BURN SKIN and EYES.

- Do not tip battery.
- Replace damaged battery.
- Flush eyes and skin immediately with water.

ENGINE HEAT can cause fire.

- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

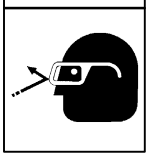
1-4. Compressed Air Hazards

COMPRESSED AIR EQUIPMENT can injure or kill.

- Incorrect installation or operation of this unit could result in equipment failure and personal injury. Only qualified persons should install, operate, and service this unit according to its Owner's Manual, industry standards, and national, state, and local codes.
- Do not exceed the rated output or capacity of the compressor or any equipment in the compressed air system. Design compressed air system so failure of any component will not put people or property at risk.
- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Do not work on compressed air system with unit running unless you are a qualified person and following the manufacturer's instructions.
- Do not modify or alter compressor or manufacturer-supplied equipment. Do not disconnect, disable, or override any safety equipment in the compressed air system.
- Use only components and accessories approved by the manufacturer.
- Keep away from potential pinch points or crush points created by equipment connected to the compressed air system.
- Do not work under or around any equipment that is supported only by air pressure. Properly support equipment by mechanical means.

HOT METAL from air arc cutting and gouging can cause fire or explosion.

- Do not cut or gouge near flammables.
- Watch for fire; keep extinguisher nearby.



COMPRESSED AIR can injure or kill.

- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Relieve pressure before disconnecting or connecting air lines.
- Check compressed air system components and all connections and hoses for damage, leaks, and wear before operating unit.
- Do not direct air stream toward self or others.
- Wear protective equipment such as safety glasses, hearing protection, leather gloves, heavy shirt and trousers, high shoes, and a cap when working on compressed air system.
- Use soapy water or an ultrasonic detector to search for leaks––never use bare hands. Do not use equipment if leaks are found.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting unit.
- If ANY air is injected into the skin or body seek medical help immediately.

BREATHING COMPRESSED AIR can injure or kill.

- Do not use compressed air for breathing.
- Use only for cutting, gouging, and tools.

TRAPPED AIR PRESSURE AND WHIPPING HOSES can injure.

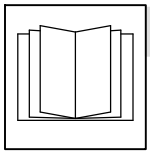
- Release air pressure from tools and system before servicing, adding or changing attachments, or opening compressor oil drain or oil fill cap.

MOVING PARTS can injure.

- Keep away from moving parts such as fans, belts and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting engine.

HOT PARTS can burn.

- Do not touch hot compressor or air system parts.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.

1-5. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

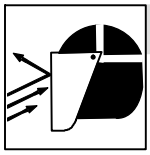
- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit and properly installed accessories only, NOT gas cylinders. Do not exceed maximum lift eye weight rating (see Specifications).
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94–110) when manually lifting heavy parts or equipment.

OVERHEATING can damage motors.

- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.
- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.



FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.

MOVING PARTS can injure.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

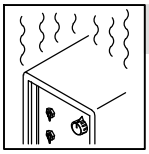
BATTERY CHARGING OUTPUT and BATTERY EXPLOSION can injure.

Battery charging not present on all models.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables, battery charging cables (if applicable), or servicing battery.
- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles unless it has a battery charging feature designed for this purpose.
- Observe correct polarity (+ and –) on batteries.
- Disconnect negative (–) cable first and connect it last.
- Keep sparks, flames, cigarettes, and other ignition sources away from batteries. Batteries produce explosive gases during normal operation and when being charged.
- Follow battery manufacturer's instructions when working on or near a battery.
- Have only qualified persons do battery charging work.
- If battery is being removed from a vehicle for charging, disconnect negative (–) cable first and connect it last. To prevent an arc, make sure all accessories are off.
- Charge lead-acid batteries only. Do not use battery charger to supply power to an extra-low-voltage electrical system or to charge dry cell batteries.
- Do not charge a frozen battery.
- Do not use damaged charging cables.
- Do not charge batteries in a closed area or where ventilation is restricted.
- Do not charge a battery that has loose terminals or one showing damage such as a cracked case or cover.
- Before charging battery, select correct charger voltage to match battery voltage.
- Set battery charging controls to the Off position before connecting to battery. Do not allow battery charging clips to touch each other.
- Keep charging cables away from vehicle hood, door, or moving parts.

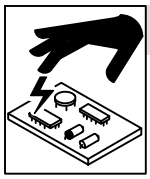
WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

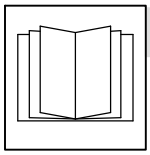


STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

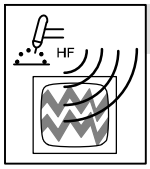
TILTING OF TRAILER can injure.

- Use tongue jack or blocks to support weight.
- Properly install welding generator onto trailer according to instructions supplied with trailer.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as microprocessors, computers, and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-6. California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. *Wash hands after handling.*

This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.*

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-7. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, is available as a free download from the American Welding Society at http://www.aws.org or purchased from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for Welding and Cutting Containers that have Held Combustibles, American Welding Society Standard AWS A6.0, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Battery Chargers, CSA Standard C22.2 NO 107.2–01, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.)

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

Portable Generators Safety Alert, U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov/cpscpub/pubs/portgen.pdf).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-8. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passers–by or conduct individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

Pour écarter les risques de blessure pour vous–même et pour autrui — lire, appliquer et ranger en lieu sûr ces consignes relatives aux précautions de sécurité et au mode opératoire.

2-1. Signification des symboles

DANGER! – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

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NOTE *– Indique des déclarations pas en relation avec des blessures personnelles.*

☞ *Indique des instructions spécifiques.*

Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

2-2. Dangers relatifs au soudage à l'arc

Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-7. Veuillez lire et respecter toutes ces normes de sécurité.

L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.

Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

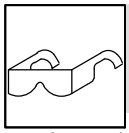
- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Des précautions de sécurité supplémentaires sont requises dans des environnements à risque comme: les endroits humides ou lorsque l'on porte des vêtements mouillés; sur des structures métalliques au sol, grillages et échafaudages; dans des positions assises, à genoux et allongées; ou quand il y a un risque important de contact accidentel avec la pièce ou le sol. Dans ces cas utiliser les appareils suivants dans l'ordre de préférence: 1) un poste à souder DC semi–automatique de type CV (MIG/MAG), 2) un poste à souder manuel (électrode enrobée) DC, 3) un poste à souder manuel AC avec tension à vide réduite. Dans la plupart des cas, un poste courant continu de type CV est recommandé. Et, ne pas travailler seul!
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installez, mettez à la terre et utilisez correctement cet équipement conformément à son Manuel d'Utilisation et aux réglementations nationales, gouvernementales et locales.
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez–les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage. Débrancher le câble pour le procédé non utilisé.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS le moteur coupé.

- Couper l'alimentation du poste et décharger les condensateurs d'entrée comme indiqué dans la Section Maintenance avant de toucher des composants.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz comprimé en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 et AWS A6.0 (voir les Normes de Sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.

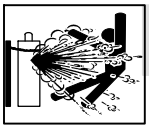
LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sonore est trop élevé.

Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.



Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz comprimé protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz comprimé, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

2-3. Dangers existant en relation avec le moteur

L'EXPLOSION DE LA BATTERIE peut provoquer des blessures.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher des câbles de batterie, des câbles de chargeur de batterie (le cas échéant) ou de batterie d'entretien.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser l'appareil de soudage pour charger des batteries ou faire démarrer des véhicules à l'aide de câbles de démarrage, sauf si l'appareil dispose d'une fonctionnalité de charge de batterie destinée à cet usage.
- Observer la polarité correcte (+ et –) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.
- Les sources d'étincelles, flammes nues, cigarettes et autres sources d'inflammation doivent être maintenues à l'écart des batteries. Ces dernières produisent des gaz explosifs en fonctionnement normal et en cours de charge.
- Respecter les consignes du fabricant de la batterie pour travailler sur une batterie ou à proximité.

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

- Arrêter le moteur avant de vérifier le niveau de carburant ou de faire le plein.
- Ne pas faire le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
- Ne pas faire le plein de carburant à ras bord; prévoir de l'espace pour son expansion.
- Faire attention de ne pas renverser de carburant. Nettoyer tout carburant renversé avant de faire démarrer le moteur.
- Jeter les chiffons dans un récipient ignifuge.
- Toujours garder le pistolet en contact avec le réservoir lors du remplissage.

Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Lorsque cela est nécessaire pour des travaux d entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (–) de batterie de la borne.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Remettre en place les portes, panneaux, recouvrements ou dispositifs de protection à la fin des travaux d'entretien et avant de mettre le moteur en marche.
- Avant d'intervenir, déposer les bougies ou injecteurs pour éviter la mise en route accidentelle du moteur.
- Bloquer le volant moteur pour éviter sa rotation lors d'une intervention sur le générateur.

LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé – voir codes en vigueur.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher des parties chaudes à mains nues.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.

LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- Il est préférable de vérifier le liquide de refroidissement une fois le moteur refroidi pour éviter de se brûler.
- Toujours vérifier le niveau de liquide de refroidissement dans le vase d'expansion (si présent), et non dans le radiateur (sauf si précisé autrement dans la section maintenance du manuel du moteur).
- Si le moteur est chaud et que le liquide doit être vérifié, opérer comme suivant.
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.

L'utilisation d'un groupe autonome à l'intérieur PEUT VOUS TUER EN QUELQUES MINUTES.

- Les fumées d'un groupe autonome contient du monoxyde de carbone. C'est un poison invisible et inodore.
- JAMAIS utiliser dans une maison ou garage, même avec les portes et fenêtres ouvertes.
- Uniquement utiliser à l'EXTERIEUR, loin des portes, fenêtres et bouches aération.

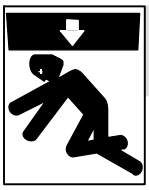
L'ACIDE DE LA BATTERIE peut provoquer des brûlures dans les YEUX et sur la PEAU.

- Ne pas renverser la batterie.
- Remplacer une batterie endommagée.
- Rincer immédiatement les yeux et la peau à l'eau.

LA CHALEUR DU MOTEUR peut provoquer un incendie.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.

2-4. Dangers liés à l'air comprimé

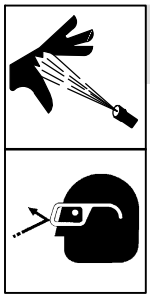


Un ÉQUIPEMENT PNEUMATIQUE risque de provoquer des blessures ou même la mort.

- Une installation ou une utilisation incorrecte de cet appareil pourrait conduire à des dégâts matériels ou corporels. Seul un personnel qualifié est autorisé à installer, utiliser et entretenir cet appareil conformément à son manuel d'utilisation, aux normes industrielles et aux codes nationaux, d'état ou locaux.
- Ne pas dépasser le débit nominal ou la capacité du compresseur ou de tout équipement du circuit d'air comprimé. Concevoir le circuit d'air comprimé de telle sorte que la défaillance d'un composant ne risque pas de provoquer un accident matériel ou corporel.
- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Ne pas intervenir sur le circuit d'air comprimé lorsque l'appareil fonctionne. Seul un personnel qualifié est autorisé, et appliquant les consignes du fabricant.
- Ne pas modifier ou altérer le compresseur ou les équipements fournis par le fabricant. Ne pas débrancher, désactiver ou neutraliser les équipements de sécurité du circuit d'air comprimé.
- Utiliser uniquement des composants et accessoires homologués par le fabricant.
- Se tenir à l'écart de tout point présentant un danger de pincement ou d'écrasement créé par l'équipement raccordé au circuit d'air comprimé.
- Ne pas intervenir sous ou autour d'un équipement qui n'est soutenu que par la pression pneumatique. Soutenir l'équipement de façon appropriée par un moyen mécanique.

MÉTAL CHAUD provenant du découpage ou du gougeage à l'arc risque de provoquer un incendie ou une explosion.

- Ne pas découper ou gouger à proximité de produits inflammables.
- Attention aux risques d'incendie: tenir un extincteur à proximité.



L'AIR COMPRIMÉ risque de provoquer des blessures ou même la mort.

- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Détendre la pression avant de débrancher ou de brancher des canalisations d'air.
- Avant d'utiliser l'appareil, contrôler les composants du circuit d'air comprimé, les branchements et les flexibles en recherchant tout signe de détérioration, de fuite et d'usure.
- Ne pas diriger un jet d'air vers soi–même ou vers autrui.
- Pour intervenir sur un circuit d'air comprimé, porter un équipement de protection tel que des lunettes de sécurité, des gants de cuir, une chemise et un pantalon en tissu résistant, des chaussures montantes et une coiffe.
- Pour rechercher des fuites, utiliser de l'eau savonneuse ou un détecteur à ultrasons, jamais les mains nues. En cas de détection de fuite, ne pas utiliser l'équipement.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de mettre en marche l'appareil.
- En cas d'injection d'air dans la peau ou le corps, demander immédiatement une assistance médicale.

L'INHALATION D'AIR COMPRIMÉ risque de provoquer des blessures ou même la mort.

- Ne pas inhaler d'air comprimé.
- Utiliser l'air comprimé uniquement pour découper ou gouger ainsi que pour l'outillage pneumatique.

Une PRESSION D'AIR RÉSIDUELLE ET DES FLEXIBLES QUI FOUETTENT risquent de provoquer des blessures.

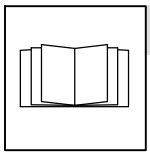
- Détendre la pression pneumatique des outils et circuits avant d'entretenir, ajouter ou changer des accessoires et avant d'ouvrir le bouchon de vidange ou de remplissage d'huile du compresseur.

Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Remettre en place les portes, panneaux, recouvrements ou dispositifs de protection à la fin des travaux d'entretien et avant de mettre le moteur en marche.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher de pièces chaudes du compresseur ou du circuit d'air.
- Prévoir une période de refroidissement avant d'intervenir sur l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.

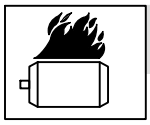
2-5. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.

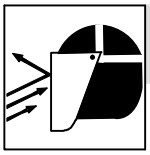
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage pour lever l'appareil et les accessoires correctement installées seuls, PAS les bouteilles de gaz. Ne pas dépasser le poids nominal maximal de l'œilleton (voir les spécifications).
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication Nº94–110) lors du levage manuelle de pièces ou équipements lourds.



LE SURCHAUFFEMENT peut endommager le moteur électrique.

- Arrêter ou déconnecter l'équipement avant de démarrer ou d'arrêter le moteur.
- Ne pas laisser tourner le moteur trop lentement sous risque d'endommager le moteur électrique à cause d'une tension et d'une fréquence trop faibles.
- Ne pas brancher de moteur de 50 ou de 60 Hz à la prise de 100 Hz, s'il y a lieu.



LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.

Les PIÈCES MOBILES peuvent causer des blessures.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

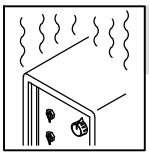
LA SORTIE DE RECHARGE et L'EXPLOSION DE LA BATTERIE peuvent provoquer des blessures.

La recharge de batterie n'existe pas sur tous les modèles.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher des câbles de batterie, des câbles de chargeur de batterie (le cas échéant) ou de batterie d'entretien.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser l'appareil de soudage pour charger des batteries ou faire démarrer des véhicules à l'aide de câbles de démarrage, sauf si l'appareil dispose d'une fonctionnalité de charge de batterie destinée à cet usage.
- Observer la polarité correcte (+ et –) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.
- Les sources d'étincelles, flammes nues, cigarettes et autres sources d'inflammation doivent être maintenues à l'écart des batteries. Ces dernières produisent des gaz explosifs en fonctionnement normal et en cours de charge.
- Respecter les consignes du fabricant de la batterie pour travailler sur une batterie ou à proximité.
- Les opérations de charge de batterie ne doivent être effectuées que par des personnes qualifiées.
- Pour enlever la batterie d'un véhicule pour la recharge, débrancher tout d'abord le câble négatif (–) et le rebrancher en dernier lieu. Pour éviter un arc, s'assurer que tous les accessoires sont débranchés.
- Ne charger que des batteries plomb–acide. Ne pas utiliser le chargeur de batterie pour alimenter un autre circuit électrique basse tension ou pour charger des batteries sèches.
- Ne pas charger une batterie gelée.
- Ne pas utiliser de câbles de charge endommagés.
- Ne pas charger des batteries dans un espace fermé ou en l'absence d'une ventilation.
- Ne pas charger une batterie dont les bornes sont desserrées ou présentant une détérioration comme par exemple un boîtier ou un couvercle fissuré.
- Avant de charger une batterie, sélectionner la tension de charge correspondant à la tension de la batterie.
- Régler les commandes de charge de batterie sur la position d'arrêt avant de brancher la batterie. Veiller à ce que les pinces de charge ne se touchent pas.
- Ranger les câbles de charge à distance du capot, des portes et des pièces mobiles du véhicule.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

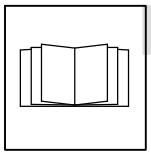
- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.

LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

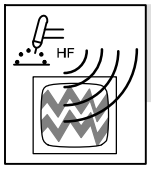
UNE REMORQUE QUI BASCULE peut provoquer des blessures.

- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-6. Proposition californienne 65 Avertissements

Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)

Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. *Se laver les mains après manipulation.*

Ce produit contient des produits chimiques, notamment du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers, des malformations congénitales ou d'autres problèmes de procréation. *Se laver les mains après utilisation.*

Pour les moteurs à essence :

Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.

Pour les moteurs diesel :

Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.

2-7. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, is available as a free download from the American Welding Society at http://www.aws.org or purchased from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for Welding and Cutting Containers that have Held Combustibles, American Welding Society Standard AWS A6.0, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Battery Chargers, CSA Standard C22.2 NO 107.2–01, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.)

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

Portable Generators Safety Alert, U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov/cpscpub/pubs/portgen.pdf).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

2-8. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

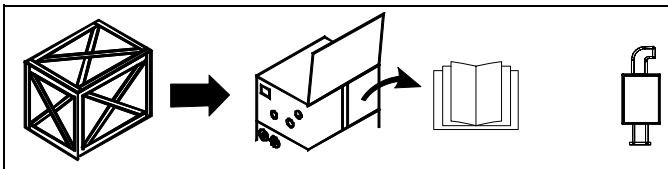
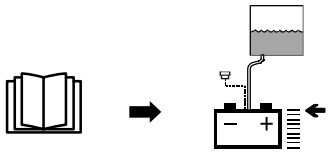
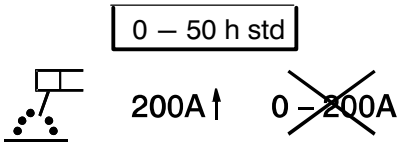
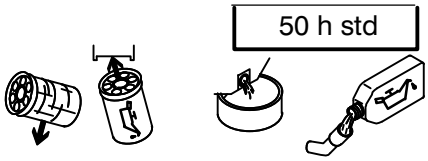
En ce qui concerne les implants médicaux :

Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

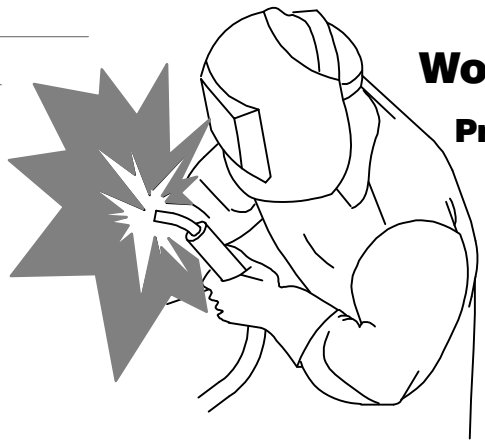
SECTION 3 – DEFINITIONS

3-1. Additional Safety Symbols And Definitions

☞ *Some symbols are found only on CE products.*

	Remove unit from shipping crate. Remove Owner's Manual from unit. Follow instructions to install muffler. Safe46 2012–05
	Read Owner's Manual. Read labels on unit. Safe47 2012–05
	Read Owner's Manual. Follow instructions to activate battery. Safe48 2012–05
	During the first 50 hours of operation keep welding load above 200 amperes. Do not weld below 200 amperes of output. Safe54 2012–05
	After the first 50 hours of operation, change the engine oil and filter. Safe55 2012–05

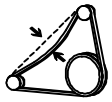
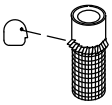
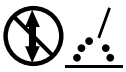
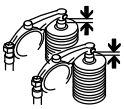
Notes



Work like a Pro!

Pros weld and cut safely. Read the safety rules at the beginning of this manual.

3-2. Miscellaneous Symbols And Definitions

Stop Engine	Fast (Run, Weld/ Power)	Slow (Idle)	Start Engine
 Check engine belt	 Check Air Cleaner	Starting Aid	Engine
Battery (Engine)	Jump start/Battery Charge	Battery Charge	Jump Start
 Do Not Switch Under Load	Read Operator's Manual	Certified/Trained Mechanic	Engine Oil
Check Injectors/ Pump	 Check Valve Clearance	Fuel	Engine Coolant Temperature
Hourmeter (HM)	Air Pressure	Temperature	Air Compressor
Positive	Negative	Wire Feed	Welding Arc
Amperes	Volts	Panel/Local	Remote
Output	Direct Current (DC)	Alternating Current (AC)	Gas Tungsten Arc Welding (TIG)
Stick (SMAW) Welding	Constant Current (CC)	MIG (GMAW) Welding	Constant Voltage (CV)
Three Phase	Single Phase	Air Carbon Arc Cutting (CAC-A)	Protective Earth (Ground)
DC Electrode Positive	DC Electrode Negative	Work Connection	Electrode Connection
Circuit Protector	Time	h Hours	s Seconds
On	Off		

SECTION 4 – SPECIFICATIONS

4-1. Weld, Power, And Engine Specifications

Welding Mode	Weld Output Range	Rated Welding Output	Maximum Open-Circuit Voltage (Nominal)	Generator Power Rating	Engine	Engine Oil Capacity	Fuel Tank Capacity
CC/DC	20 – 750 A	500 A, 40 Volts DC, 100% Duty Cycle	95	**Standard** Single-Phase, 4 kVA/kW, 34/17 A, 120/240 V AC, 50/60 Hz **3-Phase Generator Option*** Single-Phase/Three-Phase, 12/20 kVA/kW, 50/48A, 120/240 VAC, 60 Hz *In Addition To Standard 4 kVA/kW Generator Power	DEUTZ Deutz TD2011L04w Oil-Cooled, Four-Cylinder, Turbo-Charged 63.4 HP Diesel Engine	11 qt (10.4 L) At Oil Change 18 qt (17.0 L) Total Capacity (Including Oil Cooler)	25 gal (95 L)
CV/DC	14 – 40 V	600 A, 44 Volts DC, 40% Duty Cycle	56				
CC/AC (Optional)	20 - 575		64				
Battery Charge/ Jump Start	12/24 V	750 A, 12 Volt Jump Start 750 A, 24 Volt Jump Start	14/28				

4-2. Air Compressor Specifications

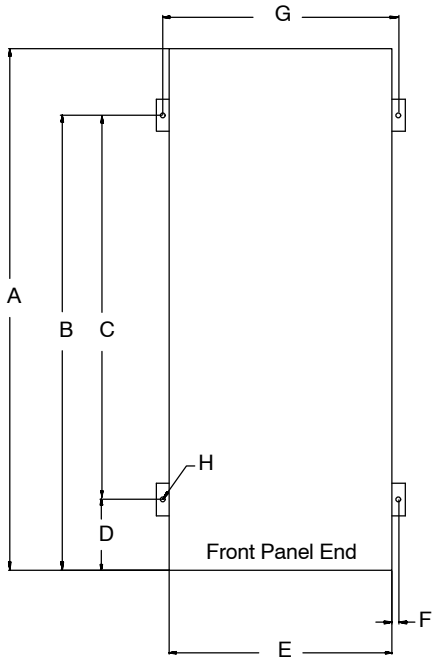
Compressor Model And Type	Air Output At Effective Working Pressure	Factory Pressure Setting	Safety Relief Valve Rating	Air Compressor Oil Capacity
Ingersoll Rand CE55 G Rotary Screw	60 scfm (1.7 m^3 min^{-1}), 100 psi (690 kPa), 100% Duty Cycle	125 psi (862 kPa)	150 psi (1034 kPa)	4 qt (3.8 L)

4-3. Sound Level Table

	Idle Speed (1250 rpm)	Weld/Power Speed (1800 rpm)	40 Volts DC At 500 Amps	44 Volts DC At 600 Amps
Air Compressor On	96.0 Lwa sound power 68.6 dBa at 23 ft (7 m) 74.5 dBA 3.3 ft (1 m) from front panel	100.9 Lwa sound power 73.1 dBa at 23 ft (7 m) 79.5 dBA 3.3 ft (1 m) from front panel	105.3 Lwa sound power 76.0 dBa at 23 ft (7 m) 84.5 dBA 3.3 ft (1 m) from front panel	107.3 Lwa sound power 78.0 dBa at 23 ft (7 m) 87.4 dBA 3.3 ft (1 m) from front panel
Air Compressor Off	93.5 Lwa sound power 66.8 dBa at 23 ft (7 m) 72.2 dBA 3.3 ft (1 m) from front panel	100.1 Lwa sound power 72.0 dBa at 23 ft (7 m) 78.5 dBA 3.3 ft (1 m) from front panel	102.2 Lwa sound power 74.1 dBa at 23 ft (7 m) 81.9 dBA 3.3 ft (1 m) from front panel	104.8 Lwa sound power 76.0 dBa at 23 ft (7 m) 85.2 dBA 3.3 ft (1 m) from front panel

4-4. Dimensions, Weights, And Operating Angles

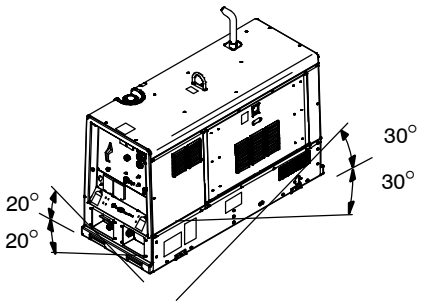
Dimensions	
Height	54-1/2 in. (1384 mm) (to top of muffler)
Width	28-1/2 in. (724 mm) (mtg. brackets turned in) 30-3/4 in. (781 mm) (mtg. brackets turned out)
Depth	69-1/2 in. (1765 mm)
A	69-1/2 in. (1765 mm)
B*	58 in. (1473 mm)
C*	46-3/8 in. (1178)
D*	11-5/8 in. (295 mm)
E	27-1/2 in. (699 mm)
F	1 in. (25 mm)
G	29-13/16 in. (757 mm)
H	9/16 in. (14 mm) Dia. 4 Holes
* With mounting brackets in center position. Dimensions vary with location of mounting brackets.	
Weight	
No fuel: 2015 lb (914 kg) w/fuel: 2190 lb (993 kg)	
Lifting Eye Weight Rating 2380 lb (1079 kg) Maximum Meets IEC Standard 60−974−1	



802 161-A

Do not exceed tilt angles or engine could be damaged or unit could tip.

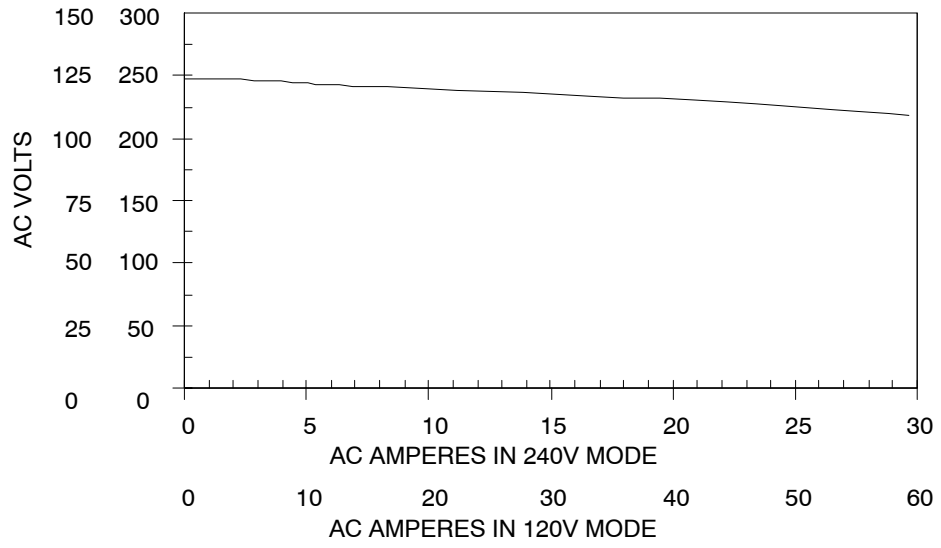
Do not move or operate unit where it could tip.



803 231

4-5. Generator AC Power Curve

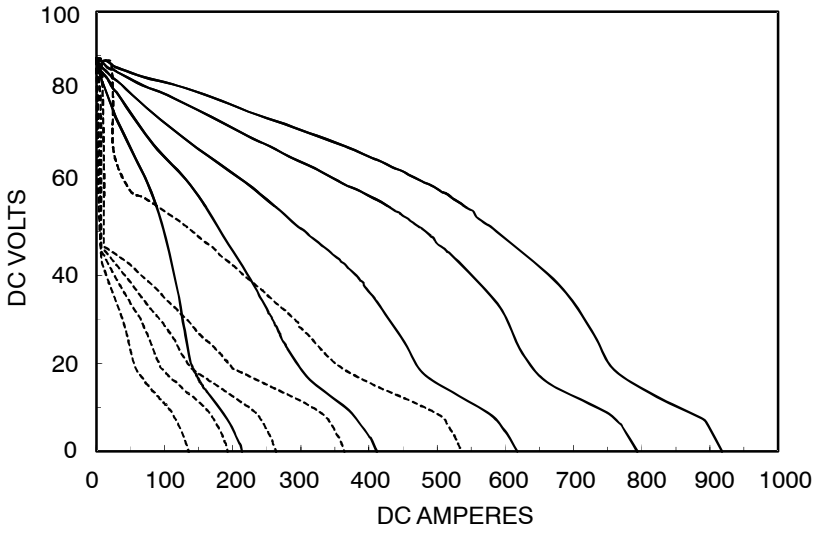
The AC power curve shows the generator power in amperes available at the 120 and 240 volt receptacles.



240 054-A

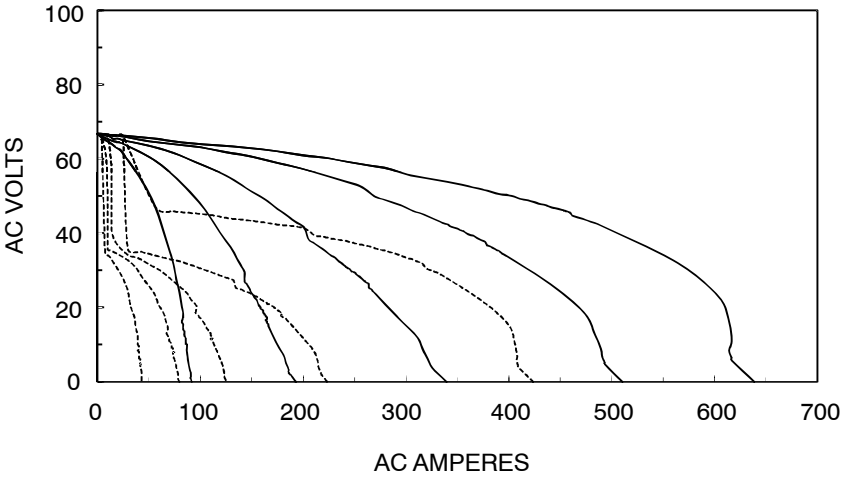
4-6. Stick And MIG Volt-Ampere Curves

A. DC Stick Mode

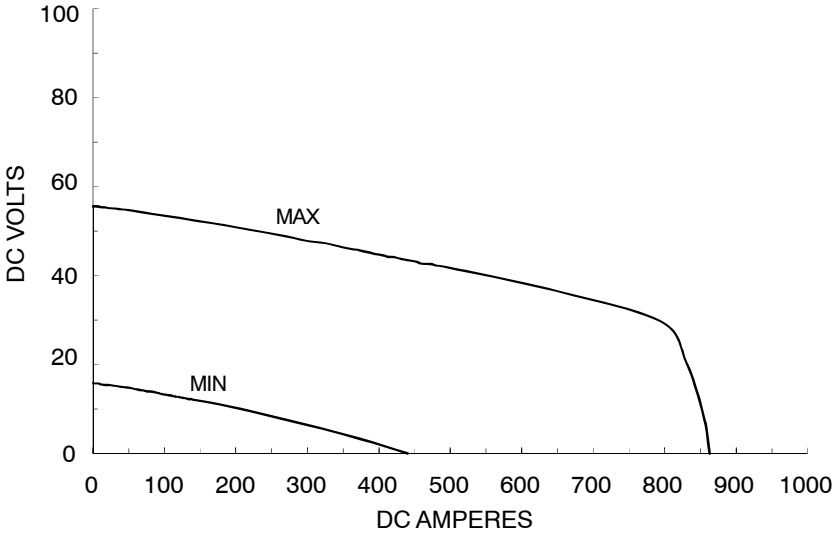


The volt-ampere curve shows the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of all other settings fall between the curves shown.

B. AC Stick Mode (Optional)



C. MIG Mode

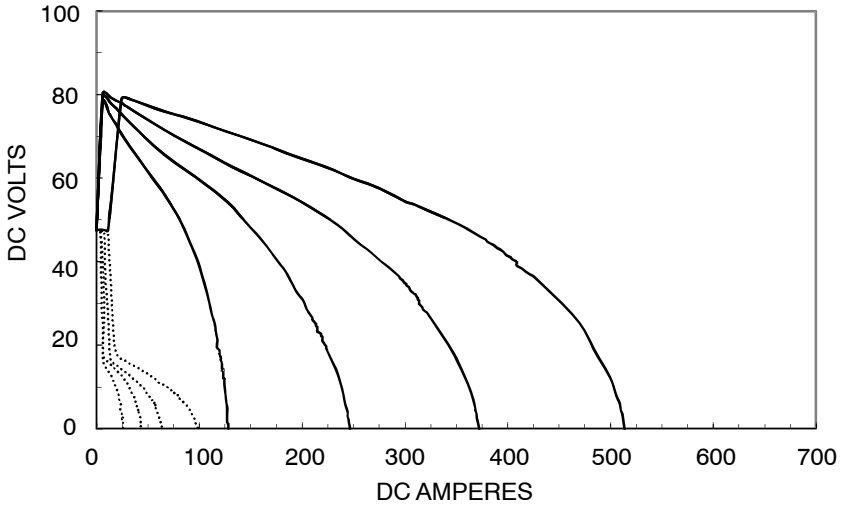


240 048-A / 240 049-A / 240 050-A

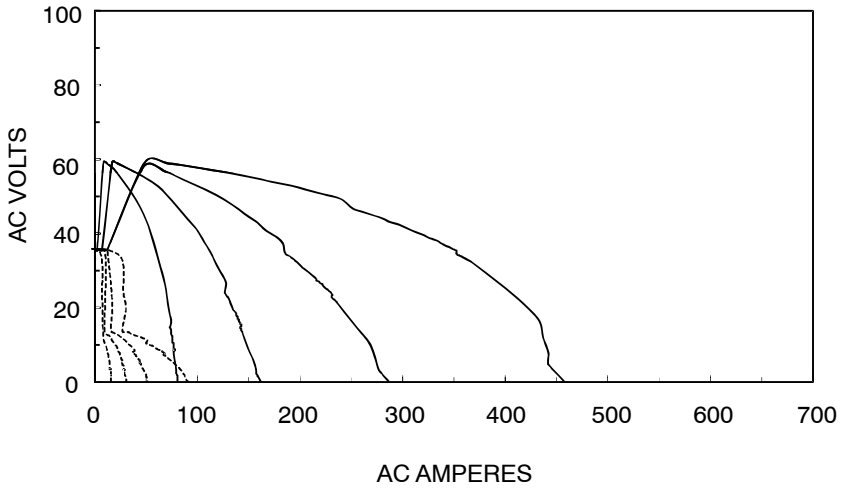
4-7. TIG Volt-Ampere Curves

The volt-ampere curve shows the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of all other settings fall between the curves shown.

A. DC TIG Mode



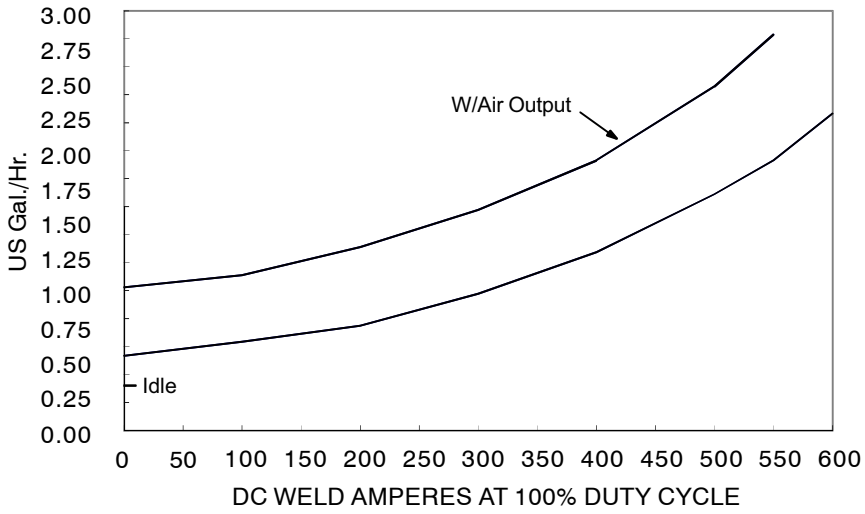
B. AC TIG Mode (Optional)



240 051-A / 240 052-A

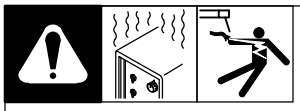
4-8. Fuel Consumption

The curve shows typical fuel use under weld, air, or generator power loads.

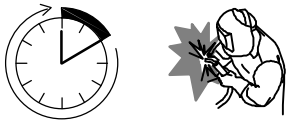


240 053-A

4-9. Duty Cycle And Overheating

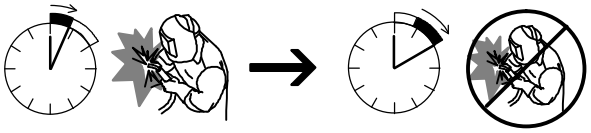


100% Duty Cycle At 500 Amperes



Continuous Welding

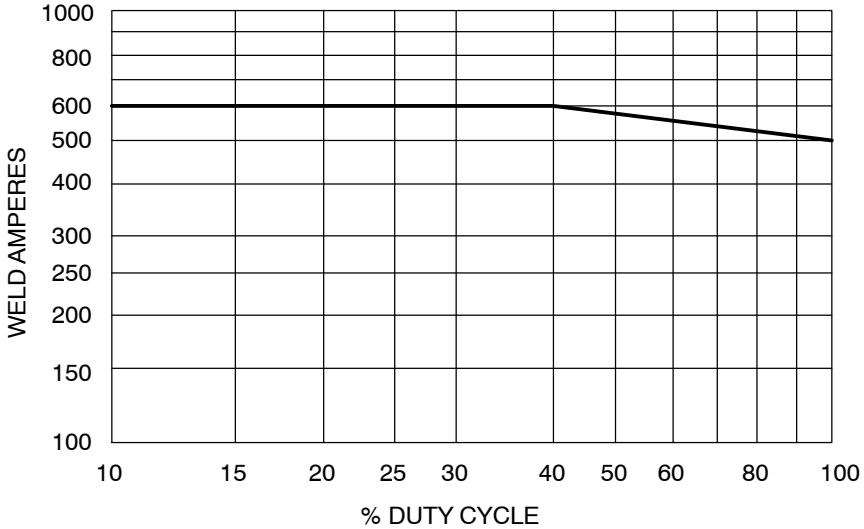
40% Duty Cycle At 600 Amperes



4 Minutes Welding 6 Minutes Resting

Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

NOTICE – *Exceeding duty cycle can damage unit and void warranty.*

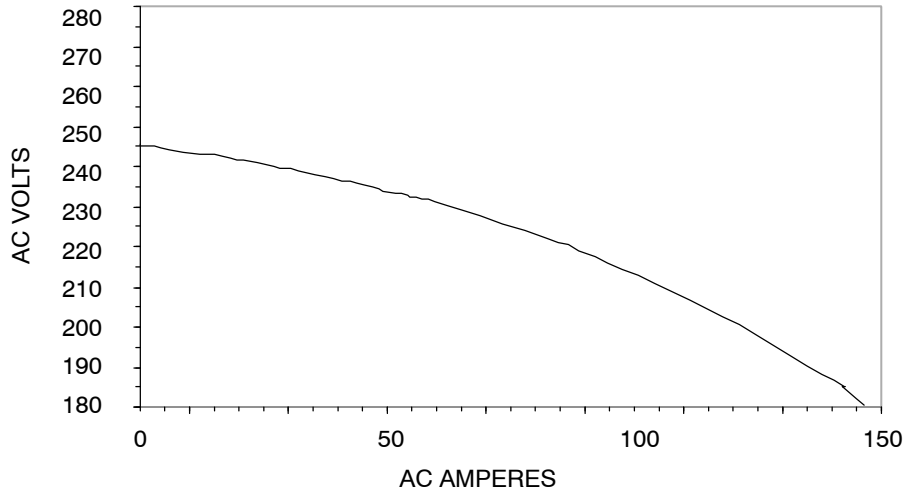


202 356

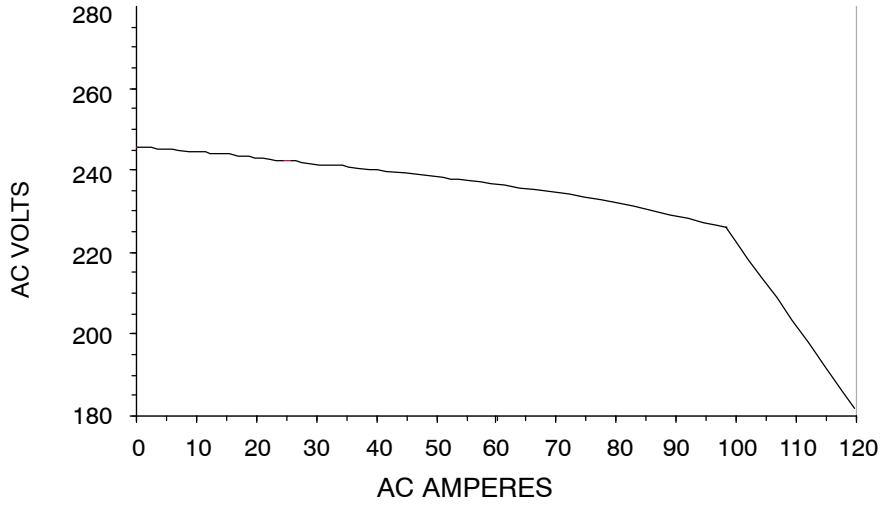
4-10. Optional 3-Phase Generator Power Curves

The AC power curves show the generator power available in amperes at the single-phase 120/240 volt receptacle or three-phase 240 volt terminals.

A. 12 kVA/kW Single-Phase AC Output (No Weld Load)



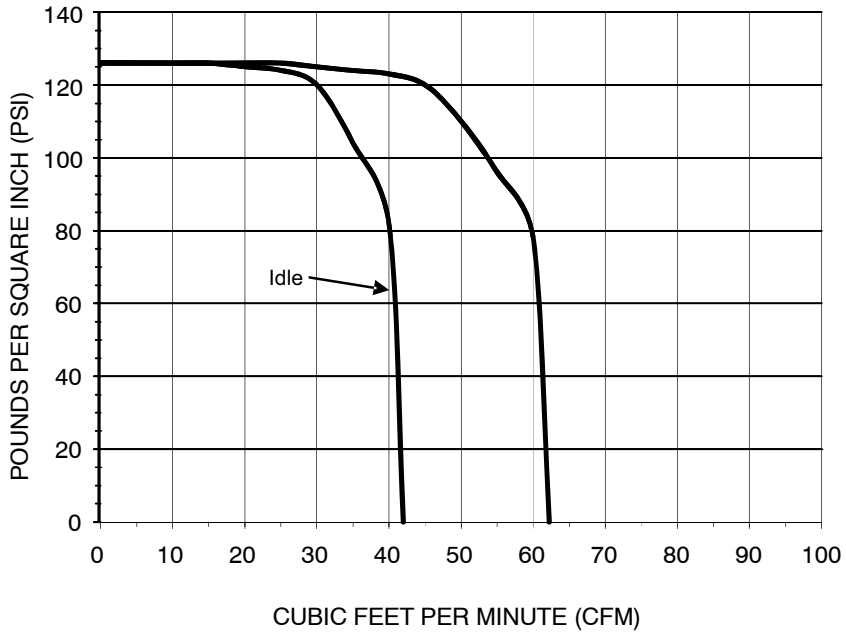
B. 20 kVA/kW Three-Phase AC Output (No Weld Load)



240 055-A / 240 056-A

4-11. Air Compressor Output Curve

The air output curve shows the volume and pressure of air available from the air compressor.

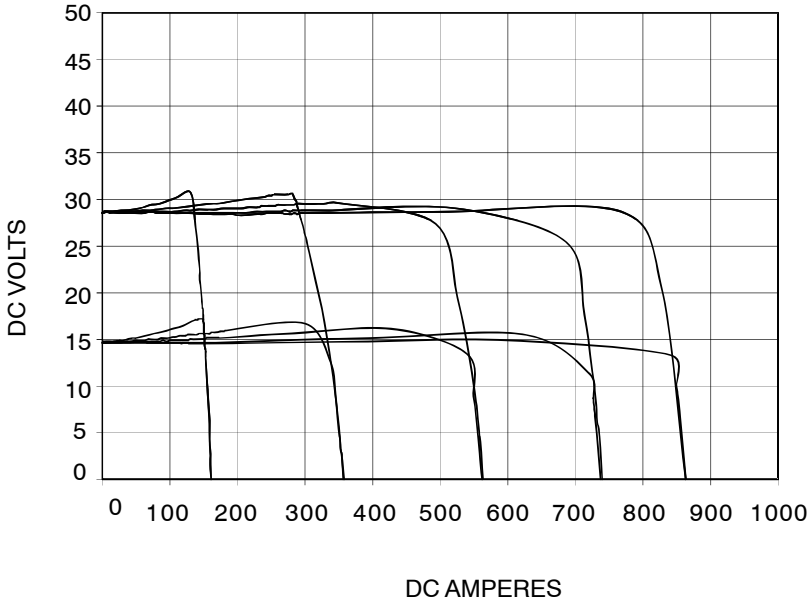


240 057-A

4-12. Optional Battery Charging Output Curve

The battery charging curves show the charging amperage and voltage output of the welding generator.

As battery voltage nears the charging voltage, charging current decreases.



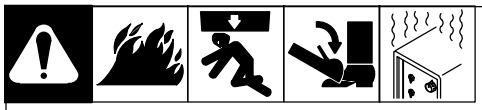
240 058-A

SECTION 5 – INSTALLATION

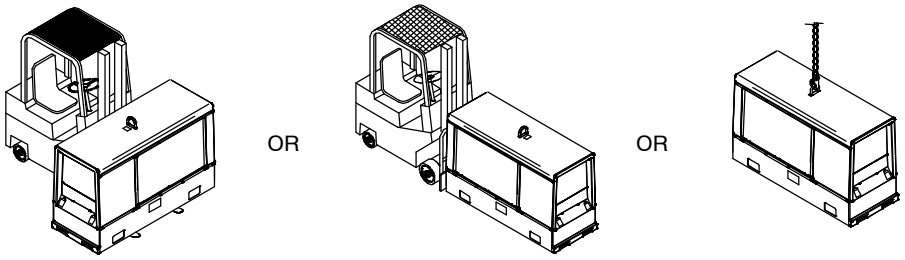
5-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the front. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

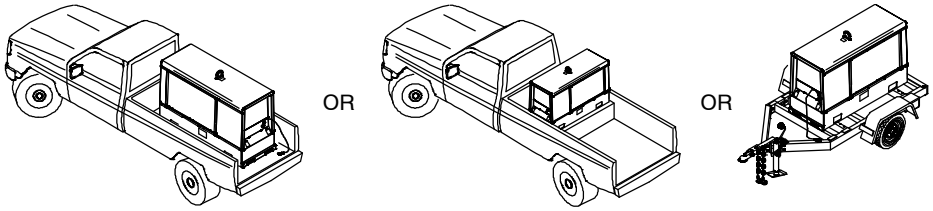
5-2. Installing Welding Generator

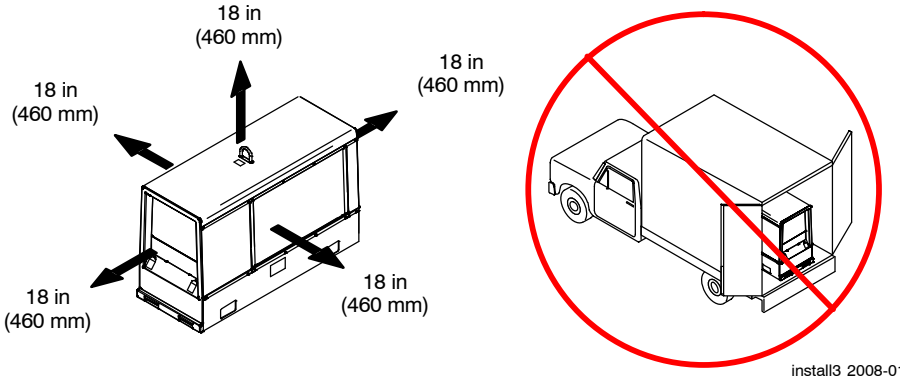


Movement



Location/Airflow Clearance





Do not move or operate unit where it could tip.

Always securely fasten welding generator onto transport vehicle or trailer and comply with all DOT and other applicable codes.

NOTICE *– Do not install unit where air flow is restricted or engine may overheat.*

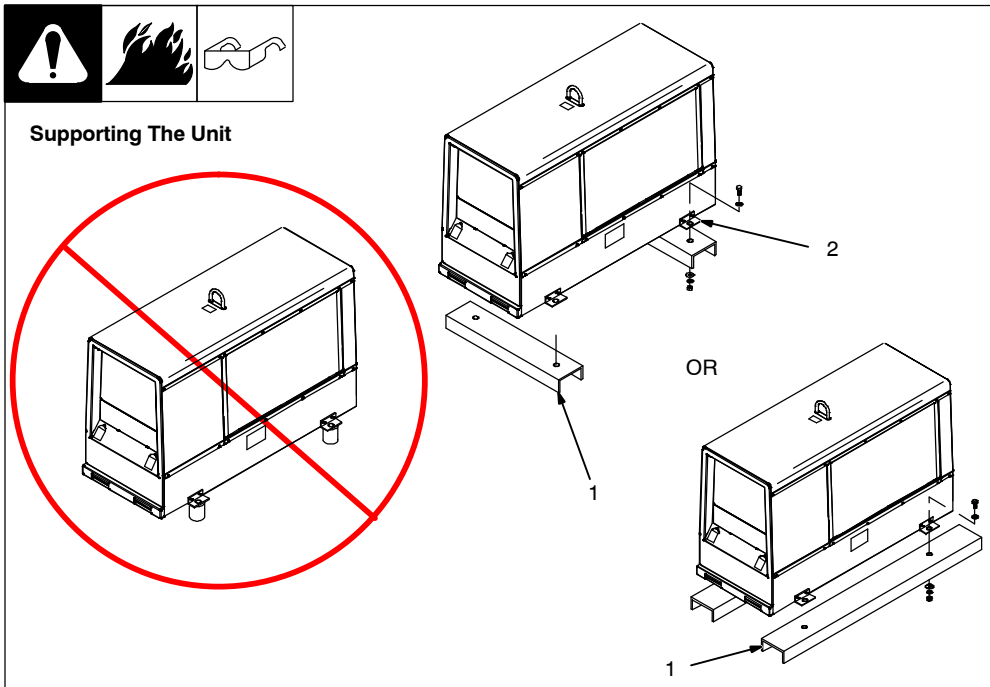
☞ *See Section 4-4 for lifting eye rating.*

☞ *See Section 5-3 for mounting information.*

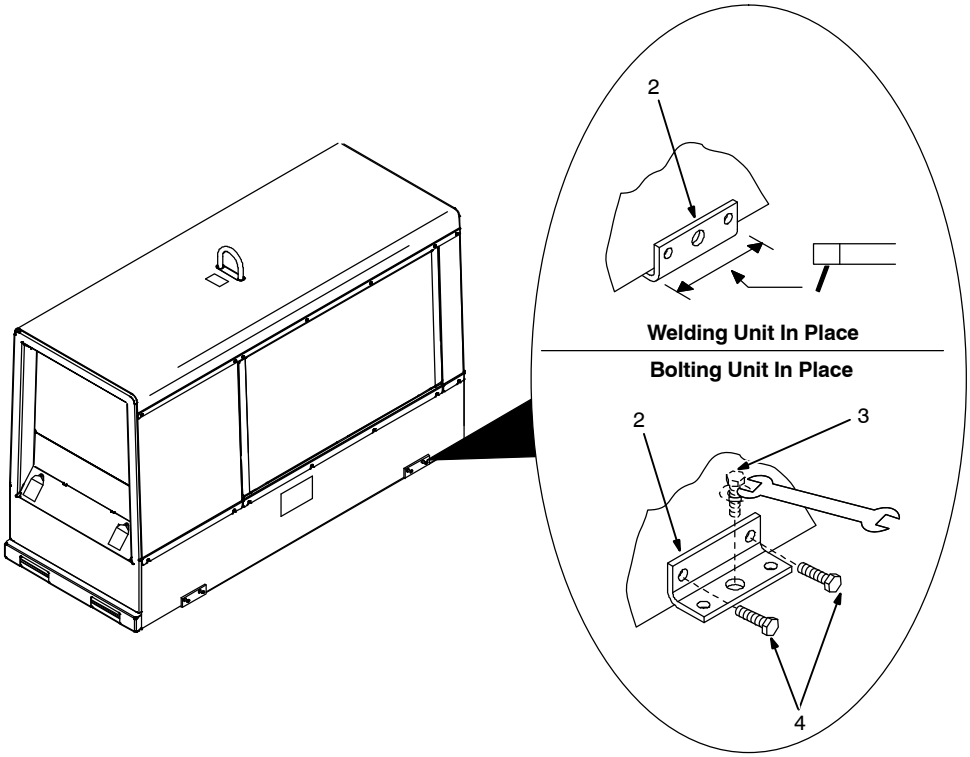
install3 2008-01 – Ref. 800 652 / Ref. 800 477-A / 803 274 / 804 712

5-3. Mounting Welding Generator

Supporting The Unit



Using Mounting Brackets



Tools Needed:

9/16 in.

Do not weld on base. Welding on base can cause fuel tank fire or explosion. Weld only on the four mounting brackets or bolt unit down.

NOTICE – *Do not mount unit by supporting the base only at the four mounting brackets. Use cross-supports to adequately support unit and prevent damage to base.*

Mounting Surface:

1 Cross-Supports

2 Mounting Brackets (Supplied)

Mount unit on flat surface or use cross-supports to support base. Secure unit with mounting brackets.

3 1/2 in. Bolt And Washer (Minimum – Not Supplied)

4 3/8-16 x 1 in. Screws (Supplied)

To Bolt Unit In Place:

Remove hardware securing the four mounting brackets to the base. Reverse brackets and reattach to base with original hardware.

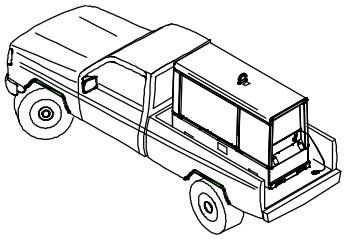
Mount unit to truck or trailer with 1/2 in. (12 mm) or larger hardware (not supplied).

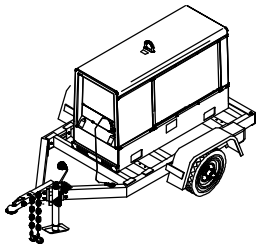
To Weld Unit In Place:

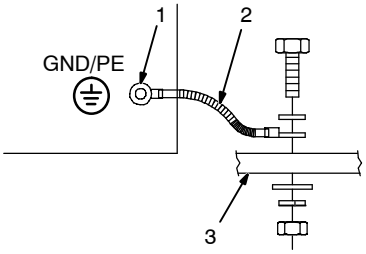
Weld unit to truck or trailer only at the four mounting brackets.

install3 2008--01 803 274 / 200 864-A / 803 231

5-4. Grounding Generator To Truck Or Trailer Frame







Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.

Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.

Bed liners, shipping skids, and some running gear insulate the welding generator from the vehicle frame. Always connect a ground wire from the generator equipment grounding terminal to bare metal on the vehicle frame as shown.

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

1 Equipment Grounding Terminal (On Front Panel)

2 Grounding Cable (Not Supplied)

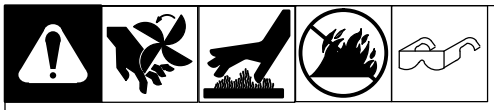
3 Metal Vehicle Frame

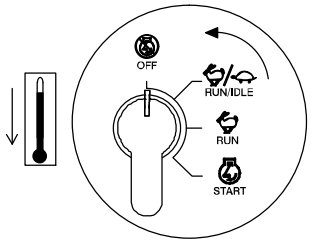
Connect cable from equipment ground terminal to metal vehicle frame. Use #8 AWG or larger insulated copper wire.

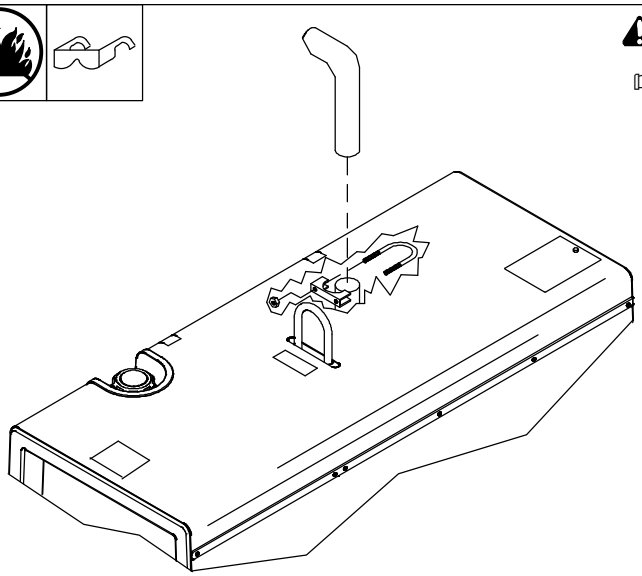
☞ *Electrically bond generator frame to vehicle frame by metal-to-metal contact.*

rot_grnd1 2011–04 – 800 652-D

5-5. Installing Exhaust Pipe



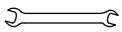




Stop engine and let cool.

☞ *Point exhaust pipe in desired direction but always away from front panel and direction of travel.*

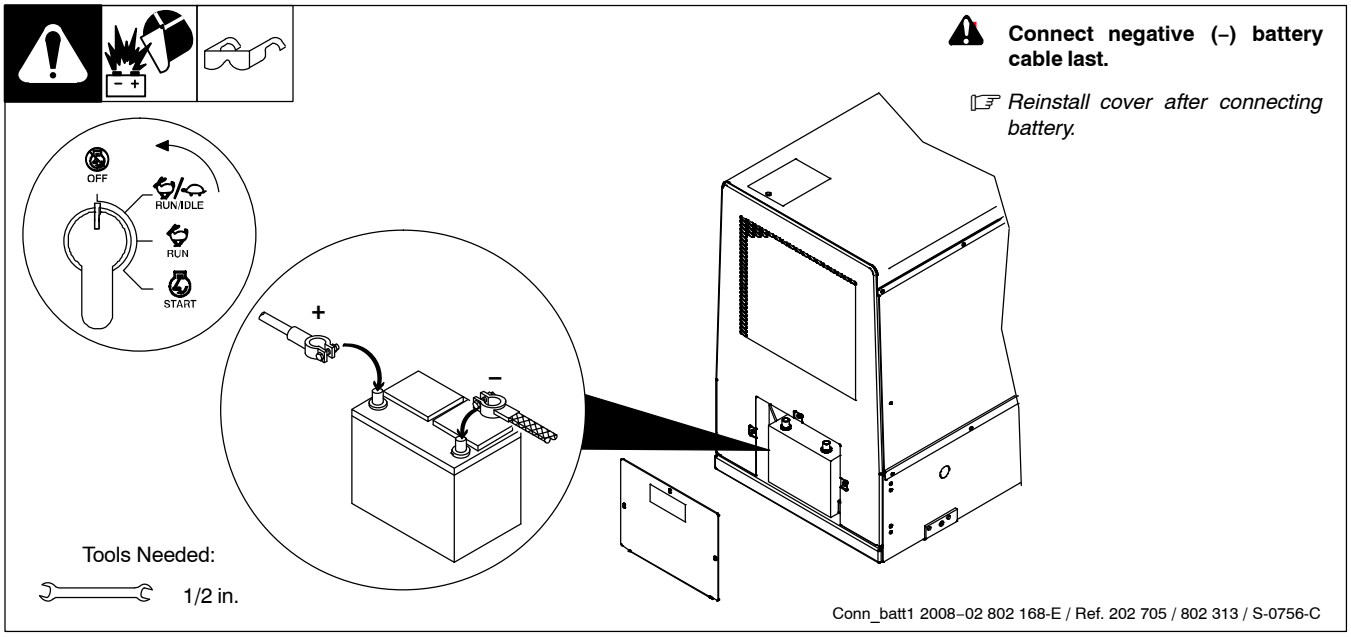
Tools Needed:



1/2 in.

Exhaust1 2008–01 Ref. 803 604 / Ref. 215 664

5-6. Connecting The Battery

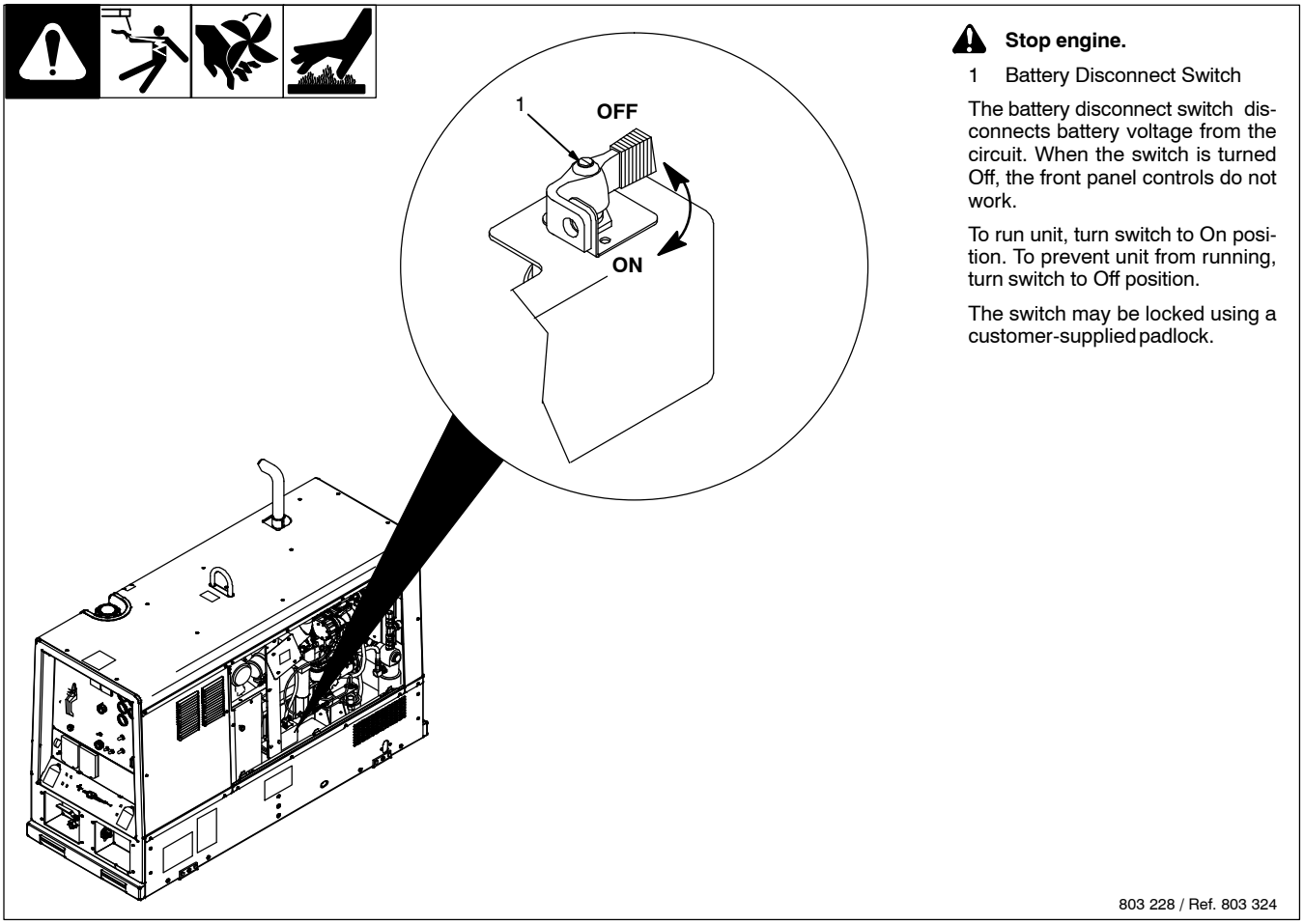


Connect negative (–) battery cable last.

☞ *Reinstall cover after connecting battery.*

Conn_batt1 2008–02 802 168-E / Ref. 202 705 / 802 313 / S-0756-C

5-7. Using The Optional Battery Disconnect Switch



Stop engine.

1 Battery Disconnect Switch

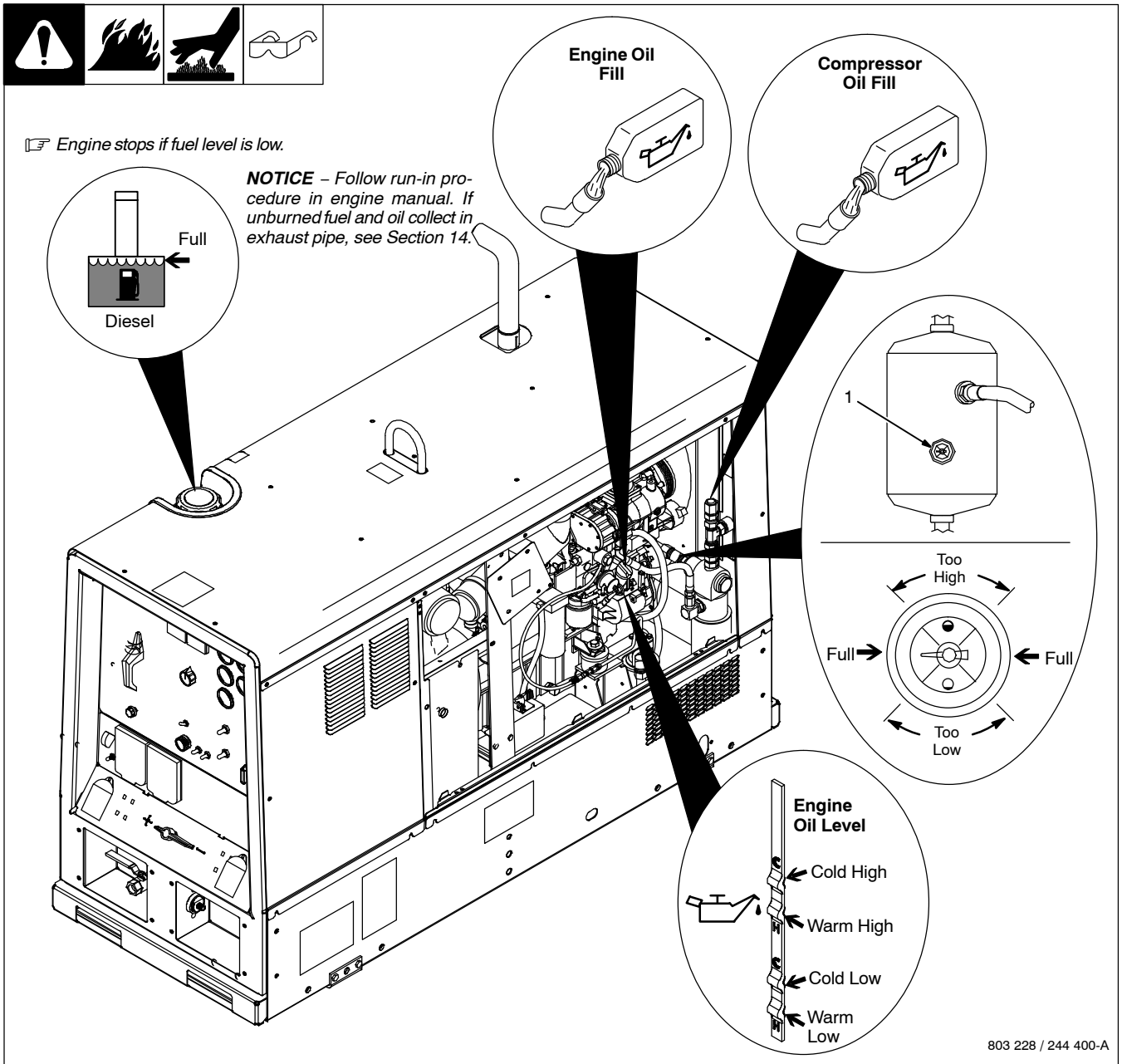
The battery disconnect switch disconnects battery voltage from the circuit. When the switch is turned Off, the front panel controls do not work.

To run unit, turn switch to On position. To prevent unit from running, turn switch to Off position.

The switch may be locked using a customer-supplied padlock.

803 228 / Ref. 803 324

5-8. Engine/Compressor Prestart Checks



☞ *Engine stops if fuel level is low.*

NOTICE *– Follow run-in procedure in engine manual. If unburned fuel and oil collect in exhaust pipe, see Section 14.*

☞ *Check all engine/compressor fluids daily.*

Engine must be cold and on a level surface. The automatic shutdown system stops engine if oil pressure is too low or coolant temperature is too high.

☞ *This unit has a low oil pressure shutdown switch. However, some conditions may cause engine damage before the engine shuts down. Check oil level often and do not use the oil pressure shutdown system to monitor oil level.*

NOTICE *– Follow run-in procedure in engine manual. If unburned fuel and oil collect in exhaust pipe, see Section 14.*

Fuel

NOTICE *– Do not use gasoline. Gasoline will damage engine.*

Add fresh diesel fuel before starting to prevent air from entering the fuel system (see engine maintenance label for fuel specifications). Leave filler neck empty to allow room for expansion.

☞ *Engine stops if fuel level is low.*

Engine Oil

After fueling, check oil with unit on level surface. Oil level on a cold engine should be between cold low and cold high indicators on dipstick. Oil level on a warm engine should be between warm high and warm low indicators on dipstick. Add oil if necessary (see maintenance label for engine oil specifications).

Compressor Oil

1 Compressor Oil Level Indicator (On Tank)

Check oil with engine off. Check oil with unit on level surface. Add oil if oil is not up to full mark on indicator (see maintenance label for oil specifications).

Cold Weather Starting

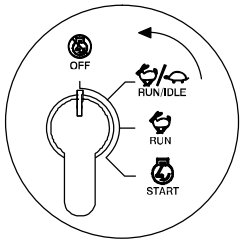
☞ *To improve cold weather starting:*
Use Starting Aid switch (see Section 6-1).

Keep battery in good condition. Store battery in warm area.

Use fuel formulated for cold weather (diesel fuel can gel in cold weather). Contact local fuel supplier for fuel information.

Use correct grade oil for cold weather (see Section 9-1).

5-9. Connecting To Weld Output Terminals



Tools Needed:

3/4 in.

Stop engine.

1 Positive (+) Weld Output Terminal

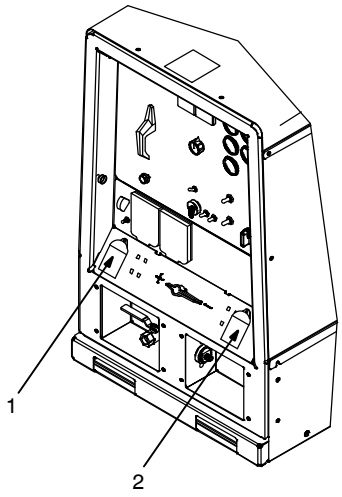
2 Negative (–) Weld Output Terminal

Stick and TIG Welding

For Stick and TIG welding Direct Current Electrode Positive (DCEP), connect electrode holder cable to Positive (+) terminal on left and work cable to Negative (–) terminal on right.

For Direct Current Electrode Negative (DCEN), reverse cable connections.

If equipped with optional Polarity switch or optional Polarity/AC switch, connect electrode holder cable to Electrode (+) terminal on left and work cable to Work (–) terminal on right.



MIG and FCAW Welding

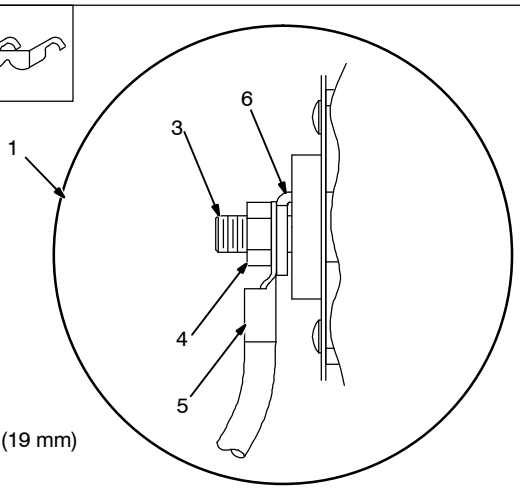
For MIG and FCAW welding Direct Current Electrode Positive (DCEP) on CC/CV models, connect wire feeder cable to Positive (+) terminal on left and work cable to Negative (–) terminal on right. Use Process/Contactor switch to select type of weld output (see Section 6-3).

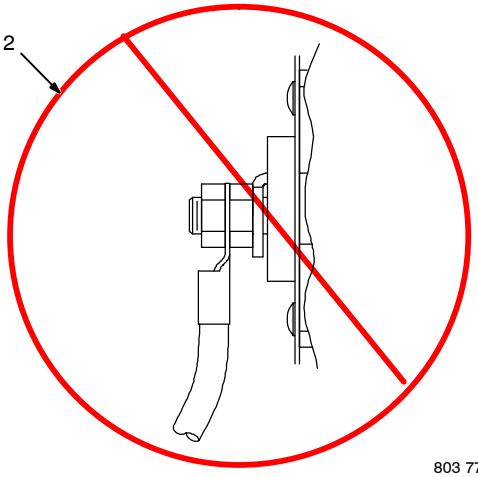
For Direct Current Electrode Negative (DCEN), reverse cable connections.

If equipped with optional Polarity switch or optional Polarity/AC switch, connect wire feeder cable to Electrode (+) terminal on left and work cable to Work (–) terminal on right.

803 231

5-10. Connecting Weld Output Cables





Tools Needed:

3/4 in. (19 mm)

803 778-B

Turn off power before connecting to weld output terminals.

Failure to properly connect weld cables may cause excessive heat and start a fire, or damage your machine.

☞ *Do not place anything between weld cable terminal and copper bar. Make sure that the surfaces of the weld cable terminal and copper bar are clean.*

1 Correct Weld Cable Connection

2 Incorrect weld Cable Connection

3 Weld Output Terminal

4 Supplied Weld Output Terminal Nut

5 Weld Cable Terminal

6 Copper Bar

Remove supplied nut from weld output terminal. Slide weld cable terminal onto weld output terminal and secure with nut so that weld cable terminal is tight against copper bar.

connecting weld output cables 3–2010

5-11. Selecting Weld Cable Sizes*

NOTICE *– The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 100 ft (30 m) from the workpiece, the total cable length in the weld circuit is 200 ft (2 cables x 100 ft). Use the 200 ft (60 m) column to determine cable size.*

Weld Output Terminals

Turn off power before connecting to weld output terminals.

Do not use worn, damaged, undersized, or poorly spliced cables.

Welding Amperes	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
	100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 – 60% Duty Cycle AWG (mm^2)	60 – 100% Duty Cycle AWG (mm^2)	10 – 100% Duty Cycle AWG (mm^2)					
100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x2/0 (2x70)
300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)
350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)	2x4/0 (2x120)
400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	2x4/0 (2x120)
500	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x3/0 (3x95)
600	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x4/0 (3x120)	3x4/0 (3x120)
700	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x4/0 (3x120)	3x4/0 (3x120)	4x4/0 (4x120)
800	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x4/0 (3x120)	3x4/0 (3x120)	4x4/0 (4x120)	4x4/0 (4x120)

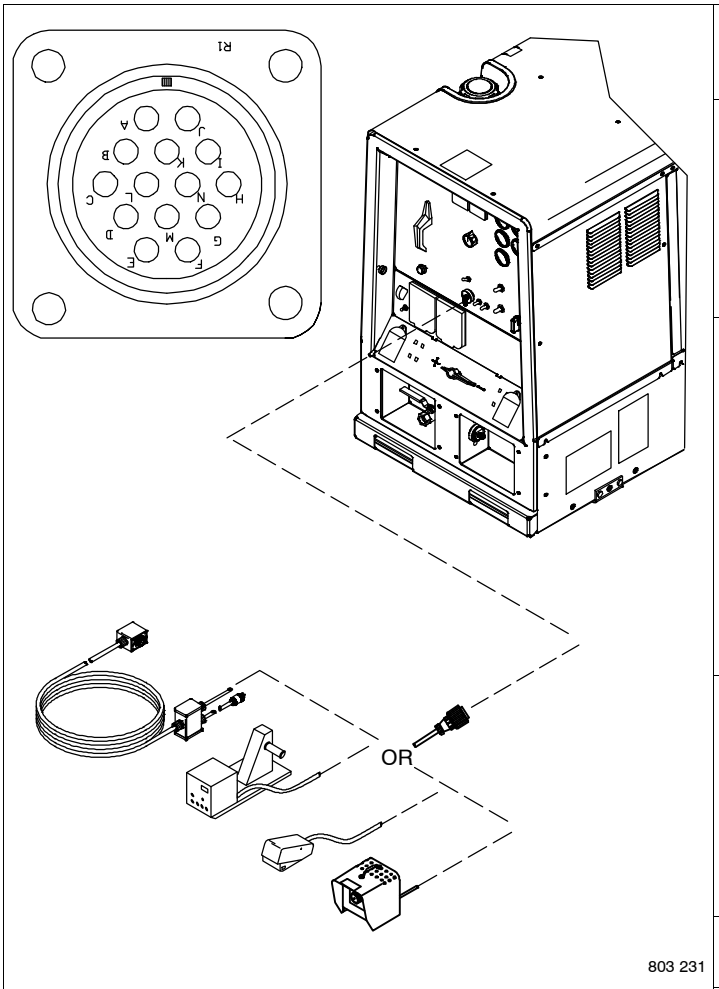
* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

**Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.
( ) = mm^2 for metric use

***For distances longer than those shown in this guide, call a factory applications rep. at 920-735-4505 (Miller) or 1-800-332-3281 (Hobart).

Ref. S-0007-J 2011–07

5-12. Connecting To Remote 14 Receptacle RC14

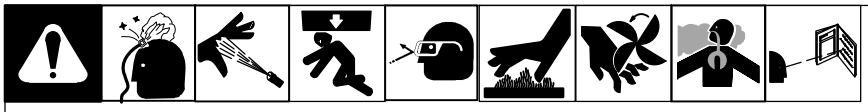


REMOTE 14	Socket*	Socket Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts AC. Protected by supplementary protector CB5.
	B	Contact closure to A completes 24 volt AC contactor control circuit.
REMOTE OUTPUT CONTROL	C	Output to remote control:+10 volts DC in MIG or Stick mode; 0 to +10 volts DC in TIG mode.
	D	Remote control circuit common.
	E	DC input command signal: 0 to +10 volts from min. to max. of remote control with Voltage/ Amperage Adjust control at max.
115 VOLTS AC OUTPUT (CONTACTOR)	I	115 volts, 10 amperes, 60 Hz ac. Protected by supplementary protector CB6.
	J	Contact closure to I completes 115 volt AC contactor control circuit.
GND	K	Chassis common.
NEUTRAL	G	Circuit common for 24 and 115 volt AC circuit.

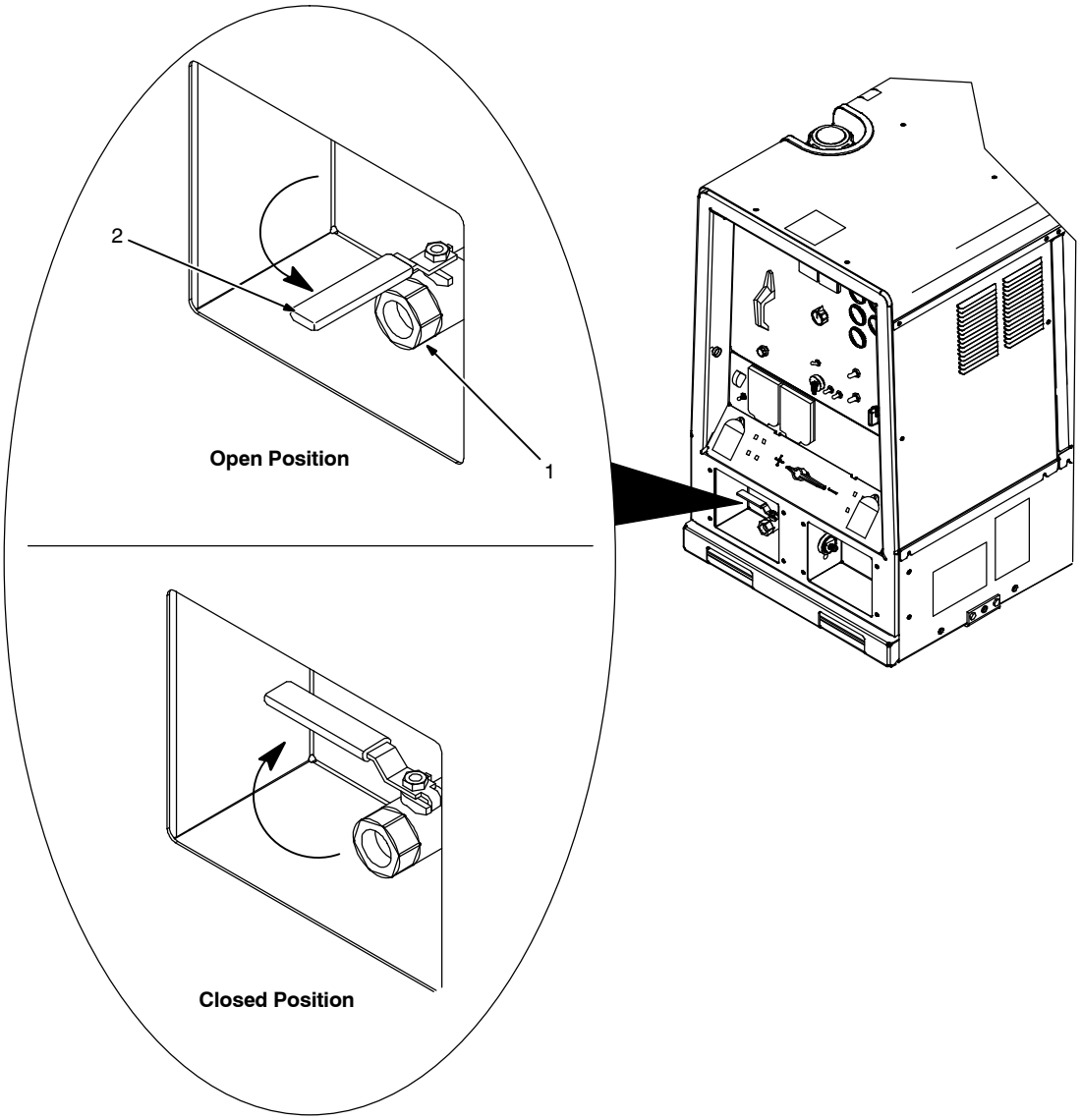
*The remaining sockets are not used.

Notes

5-13. Connecting To The Air Compressor



Stop engine and release air pressure before servicing compressor.



803 231

Air pressure is present at air shutoff valve whenever Air Pressure Gauge on front panel indicates air pressure.

1 3/4 in. NPT Air Pressure Fitting

2 Air Shutoff Valve

Connect air hose with 3/4 in. NPT fitting (not supplied) to air shutoff valve.

Be sure valve is in open position when using air compressor.

The compressor runs and air pressure is available whenever the engine is running and the front panel Compressor switch is moved to the On position (see Section 6-1).

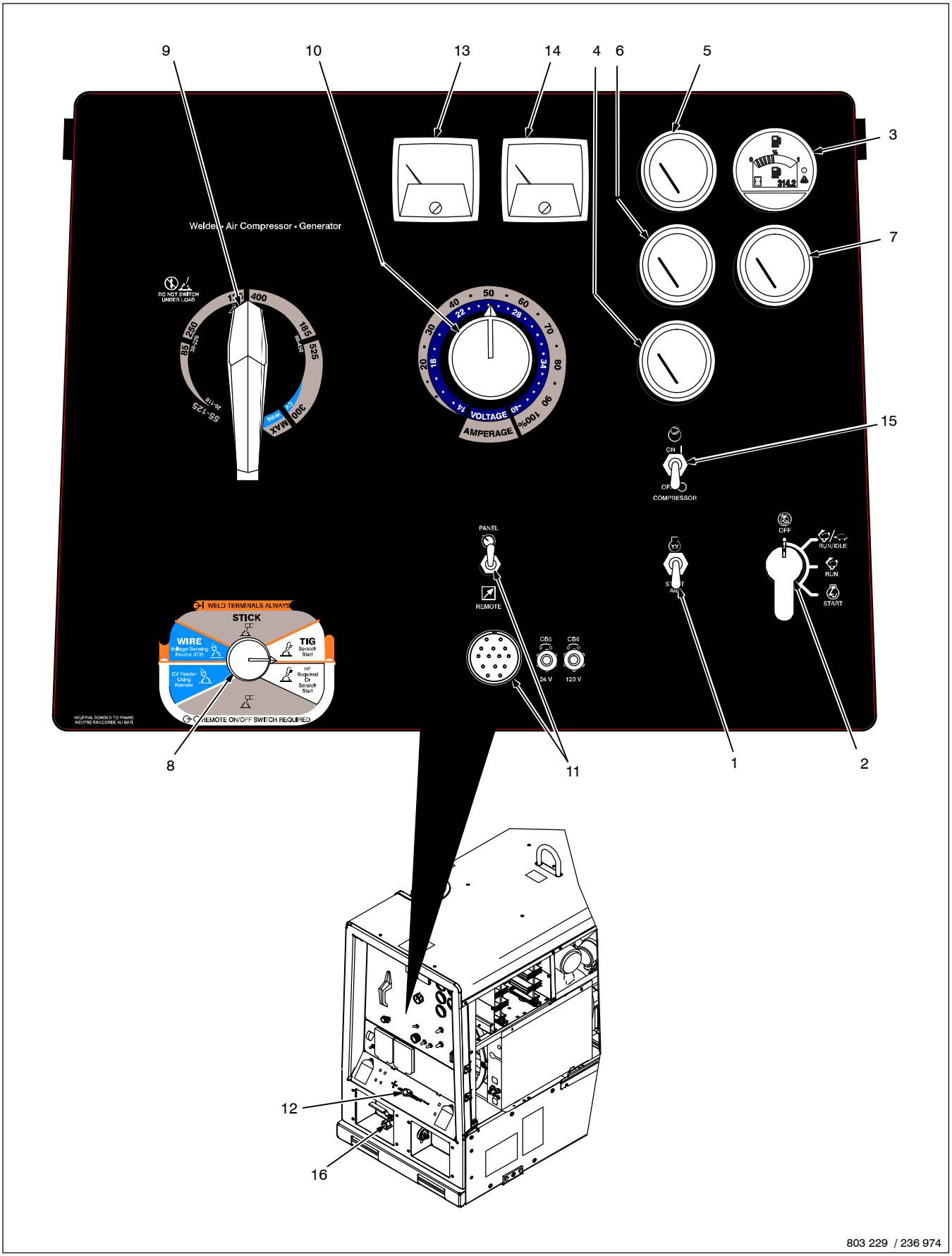
Run engine at weld/power speed for maximum air compressor output. Compressor output is reduced when engine is running at idle speed.

The air compressor will not start if still under pressure. If air compressor is turned off, wait for air pressure to bleed off (about 20 seconds) before turning air compressor on again.

☞ *Using the air compressor does not significantly affect weld or generator power output.*

SECTION 6 – OPERATING THE WELDING GENERATOR

6-1. Controls (See Section 6-2)



803 229 / 236 974

6-2. Description Of Controls (See Section 6-1)

Engine Starting Controls

1 Starting Aid Switch

Use switch to energize starting aid for cold weather starting.

Push switch up for 60 seconds to operate the starting aid (intake air heater) before cranking engine (see starting instructions following).

2 Engine Control Switch

Use switch to start engine, select engine speed, and stop engine.

In Run position, engine runs at weld/power speed. In Run/Idle position, engine runs at idle speed with no generator power or weld load, and weld/power speed with load applied.

The air compressor load does not affect engine speed. Run engine at weld/power speed for maximum air compressor output.

To Start:

☞ *If engine does not start, let engine come to a complete stop before attempting restart.*

Above 32° F (0° C): turn Engine Control switch to Start. Release Engine Control switch when engine starts.

Below 32° F (0° C) using starting aid switch:
Turn Engine Control switch to Run/Idle position. Push Starting Aid switch up for 60 seconds. While still holding Starting Aid switch, turn Engine Control switch to Start. Release Engine Control switch and Starting Aid switch when engine starts.

To Stop: turn Engine Control switch to Off position.

Engine/Compressor Gauges

3 Engine Fuel/Hour Gauge

Use gauge to monitor engine running time for scheduling maintenance and to determine cause of engine shutdowns.

Use gauge to check fuel level. Engine stops if fuel level is low.

To check fuel level when engine is not running, turn Engine Control switch to Run or Run/Idle position.

See Section 6-5 for complete fuel/hour gauge information.

4 Air Pressure Gauge

Use gauge to check compressor air pressure.

5 Engine Oil Pressure Gauge

Normal pressure is 30 – 60 psi (206 – 414 kPa). Engine stops if pressure is below 20 psi (138 kPa).

6 Engine Temperature Gauge

Normal temperature is 212 - 239° F (100 - 115° C). Engine stops if temperature exceeds 270° F (132° C).

7 Battery Voltmeter

Use gauge to check battery voltage and monitor the engine charging system. The meter should read about 14 volts DC when the engine is running, and about 12 volts DC when the engine is stopped.

Weld Controls

8 Process/Contactor Switch

See Section 6-3 for Process/Contactor switch information.

9 Ampere Range Switch

NOTICE *– Do not switch under load.*

Use switch to select weld amperage range.

Use all five ranges for Stick welding, and the lowest four ranges for TIG welding. Read the upper set of numbers at each range for Stick welding and the lower set at each range for TIG welding.

Use the highest range for MIG welding and for cutting and gouging (CAC-A).

For most welding applications, use lowest amperage range possible to help prevent arc outages.

10 Voltage/Amperage Adjust Control

With Process/Contactor switch in any Stick or TIG setting, use control to adjust amperage within range selected by Ampere Range switch. With Process/Contactor switch in any MIG position, use control to adjust voltage. With Panel/Remote Switch in Remote position, control limits the remote amperage in TIG mode, but has no effect in Stick and MIG modes.

Weld output would be about 263 A DC with controls set as shown (50% of 125 to 400 A).

☞ *The numbers around the Voltage/Amperage Adjust control are for reference only and do not represent an actual percentage value.*

11 Panel/Remote Switch And Remote 14 Receptacle

Use switch to select front panel or remote voltage/amperage control. For remote control, place switch in Remote position and connect remote control to Remote 14 receptacle RC14 (see Sections 5-12 and 6-4).

12 Polarity/AC Selector Switch (Optional) Or Output Selector Switch (Optional)

NOTICE *– Do not switch under load.*

Use Polarity/AC selector switch to select AC or DC weld output and DC weld output polarity.

Use Output Selector switch to select AC Weld, DC Weld, or battery charge output (see Section 8-5).

Weld Meters

13 AC/DC Voltmeter (Optional)

Voltmeter displays voltage at the weld output terminals, but not necessarily the welding arc due to resistance of cable and connections.

14 AC/DC Ammeter (Optional)

Ammeter displays amperage output of the unit.

Air Compressor Controls

15 Air Compressor Switch

Use switch to turn air compressor on and off. Air pressure is present at the compressor air shutoff valve whenever the compressor is running. The compressor shuts off when the engine stops. To use air, the compressor must be turned on each time the engine is started.

The air compressor will not start if still under pressure. If air compressor is turned off, wait for air pressure to bleed off (about 20 seconds) before turning air compressor on again.

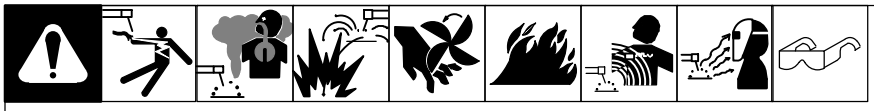
☞ *To extend clutch bearing life, cycle air compressor off and on once every two hours during periods of extended use.*

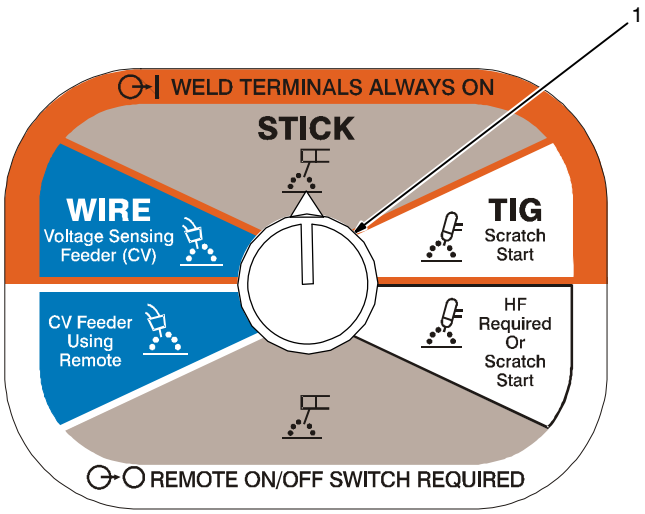
16 Air Shutoff Valve

⚠ **Air pressure is present at valve whenever Air Pressure Gauge (item 4) indicates air pressure.**

Close valve to stop air flow when connecting or changing tools or air hoses (see Section 5-13).

6-3. Process/Contactor Switch





1 Process/Contactor Switch

Weld output terminals are energized when Process/Contactor switch is in a Weld Terminals Always On position and the engine is running.

DC voltage is still present at the weld terminals when Process/Contactor switch is in the Remote On/Off Switch Required – Stick position and the engine is running.

Use switch to select weld process and weld output on/off control (see table below and Section 6-4).

Place switch in Remote On/Off Switch Required positions to turn weld output on and off with a device connected to the remote 14 receptacle.

Place switch in Weld Terminals Always On positions for weld output to be on whenever the engine is running.

Use Stick position for air carbon arc (CAC-A) cutting and gouging.

When switch is in a Stick position, the arc drive (dig) circuit provides additional amperage during low voltage (short arc length conditions) to prevent "sticking" electrodes.

The arc drive (dig) circuit is disabled when switch is in MIG or TIG positions.

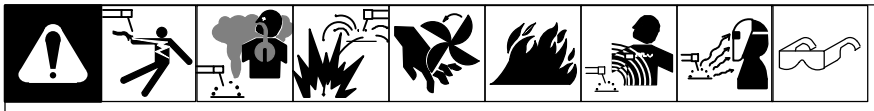
☞ *The engine auto idle option does not work in the Remote On/Off Switch Required-TIG mode.*

236 974

Process/Contactor Switch Settings

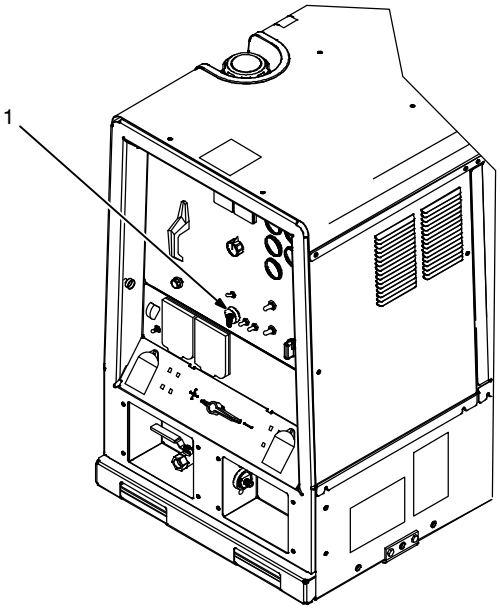
Switch Setting	Process	Output On/Off Control	Engine Auto Idle (Optional)
Remote On/Off Switch Required – TIG, HF Required Or Scratch Start TIG	GTAW With HF Unit, Pulsing Device, Or Remote Control	At Remote 14 Receptacle	Not Active
Remote On/Off Switch Required – Stick	Stick (SMAW) With Remote On/Off	At Remote 14 Receptacle	Active
Remote On/Off Switch Required – CV Feeder Using Remote	MIG (GMAW)	At Remote 14 Receptacle	Active
Weld Terminals Always On – Wire	MIG (GMAW)	Electrode Hot	Active
Weld Terminals Always On – Stick	Stick (SMAW), Air Carbon Arc (CAC-A) Cutting And Gouging	Electrode Hot	Active
Weld Terminals Always On – TIG, Scratch Start	TIG Scratch Start (GTAW)	Electrode Hot	Active

6-4. Using Remote Voltage/Amperage Control



1 Remote 14 Receptacle RC14

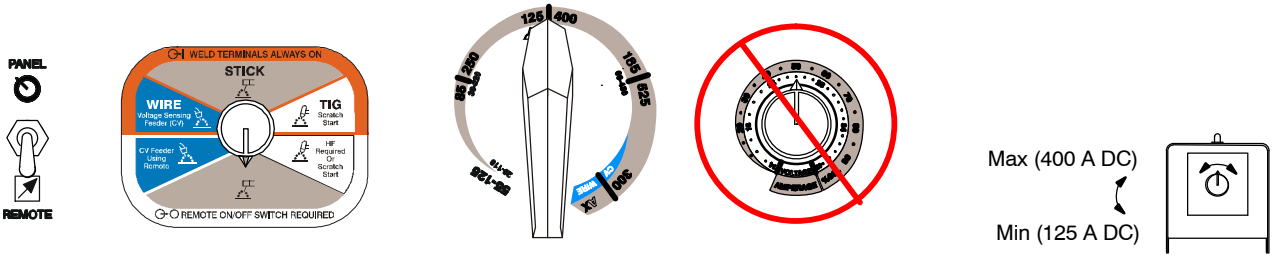
Connect optional remote control to RC14 (see Section 5-12).



803 231

Example: Combination Remote Amperage Control (Stick)

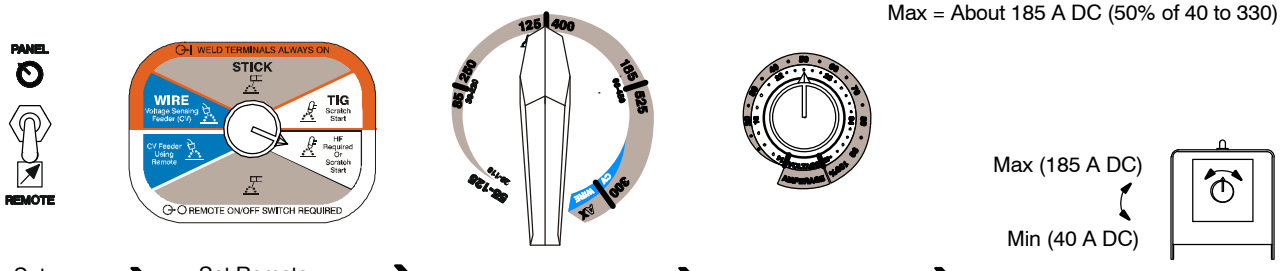
In Example:
Process = Stick (Using Remote On/Off)
Range = 125 to 400 A DC
Min = 125 A DC
Max = 400 A DC



Set Panel/Remote Switch → Set Remote Process → Set Range → Control Not Used In Remote On/Off Switch Required – Stick Mode → Adjust Optional Remote Control

Example: Combination Remote Amperage Control (TIG)

In Example:
Process = TIG (Using Remote On/Off)
Range = 40 to 330 A DC
Percentage Of Range = 50%
Min = 40 A DC
Max = About 185 A DC (50% of 40 to 330)

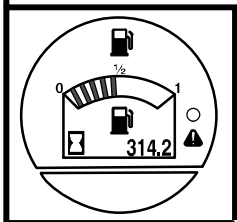


Set Panel/Remote Switch → Set Remote Process → Set Range → Set Control → Adjust Optional Remote Control

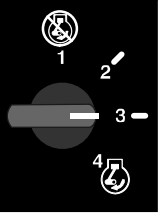
0774 / Ref. 236 974 / 803 231

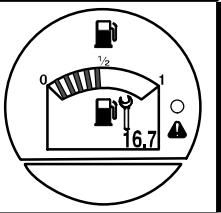
6-5. Fuel/Hour Gauge Descriptions

FUEL/HOUR GAUGE DESCRIPTIONS

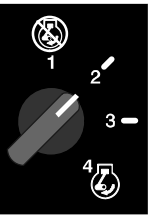


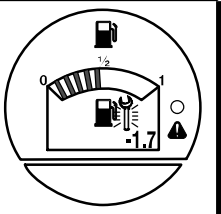
ENGINE HOURS: Gauge will display engine hours while engine is running. To display engine hours while the engine is off, place Engine Control switch in position “3”.





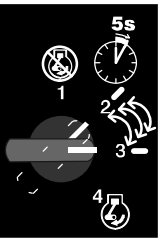
OIL CHANGE INTERVAL: Gauge will display hours remaining before oil change is due with Engine Control switch in position “2” (with engine off).

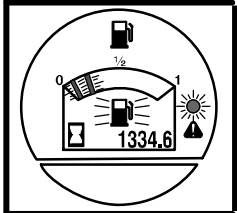




OIL CHANGE DUE: Gauge will display blinking wrench when oil change is due (0 to −99 hours).

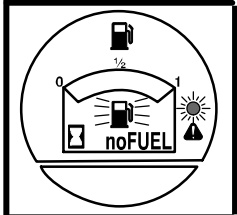
To Reset: Toggle Engine Control switch between position “2” and “3” three times within 5 seconds (engine off).





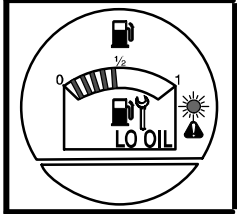
LOW FUEL PREWARNING: Fault indicator flashes when fuel level reaches 2 bars. Flashing rate increases as fuel level drops.
LOW FUEL: Fuel level low when fuel icon and last bar in fuel gauge blink.

To Reset: Refuel.



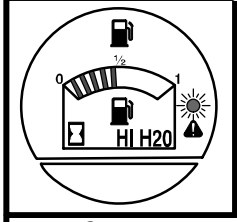
NO FUEL: Engine shuts down before fuel runs out. Display shows “noFuel”, and fuel icon and fault indicator flash.

To Reset: Refuel.



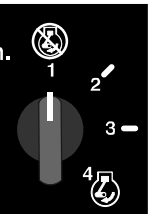
LOW OIL PRESSURE: Engine shuts down when oil pressure is low. Display shows “LO OIL”, fault indicator flashes and wrench is displayed.

To Reset: Place Engine Control switch in OFF position.



HIGH COOLANT TEMP: Engine shuts down when coolant temperature is high. Display shows “HI H2O” and fault indicator flashes.

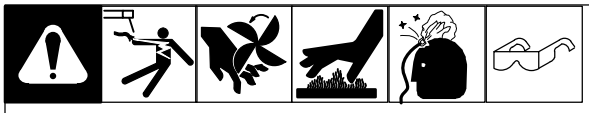
To Reset: Place Engine Control switch in OFF position.

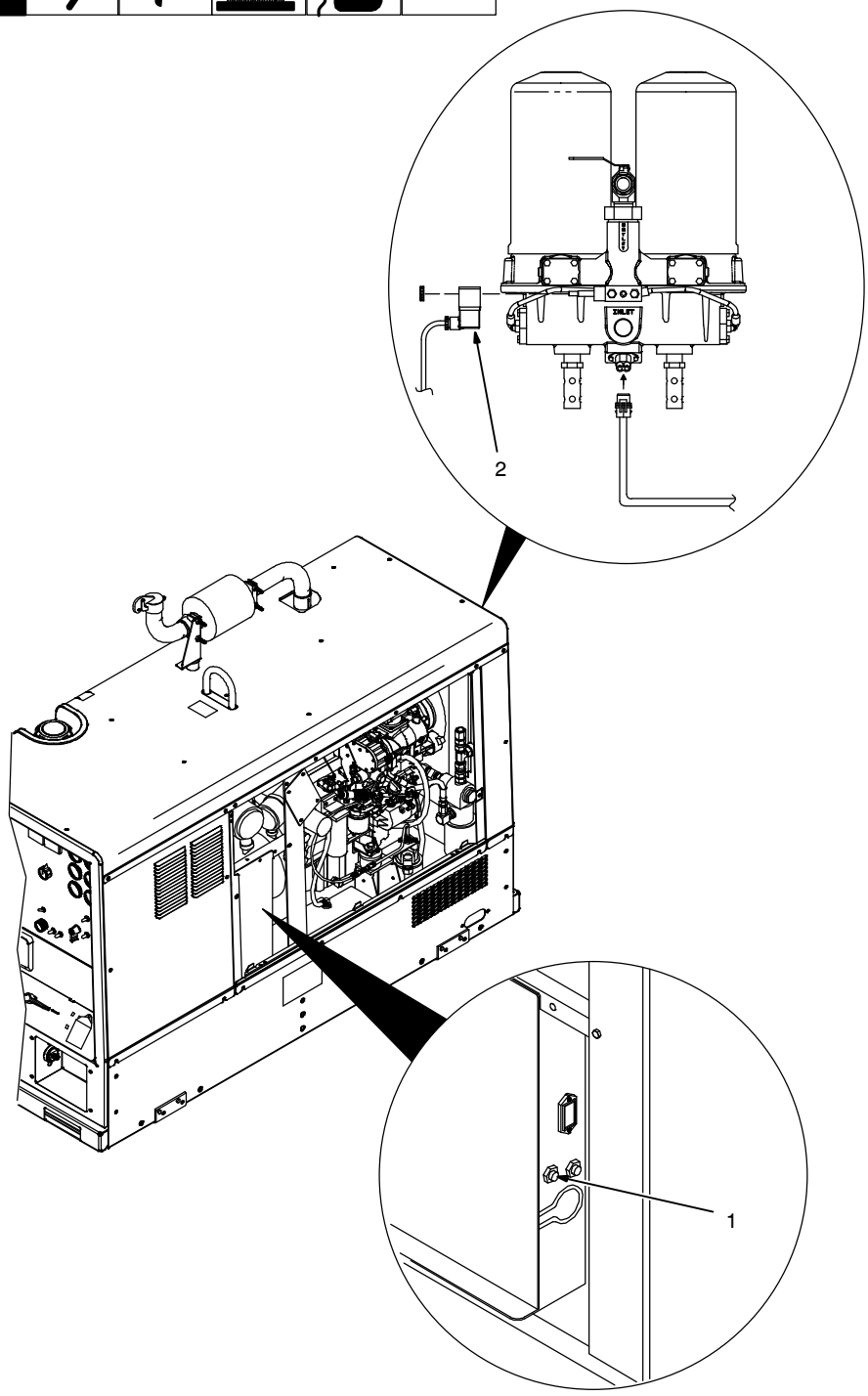


Note: Switch positions are numbered to illustrate that there are four switch positions. Actual graphics on front panel will vary.

238 650-B

6-6. Optional Air Dryer Operation





The air dryers blow out (purge) moisture and debris when the air compressor is being used. The air dryer heaters operate whenever the welding generator is running.

See the supplied air dryer Owner's Manual for air dryer maintenance and service information.

☞ *When battery access is required, disconnect and remove the air dryer assembly as described in Section 9-10.*

1 Circuit Breaker CB8

CB8 protects the dryer heaters from damage due to overload. If CB8 opens, the heaters do not work and the dryer does not discharge moisture in cold weather.

Press button to reset circuit breaker CB8.

☞ *When a circuit breaker opens, it usually indicates a more serious problem exists. Contact a Factory Authorized Service Agent.*

Start engine, and turn on air compressor. Check fittings for air leaks and tighten fittings if necessary.

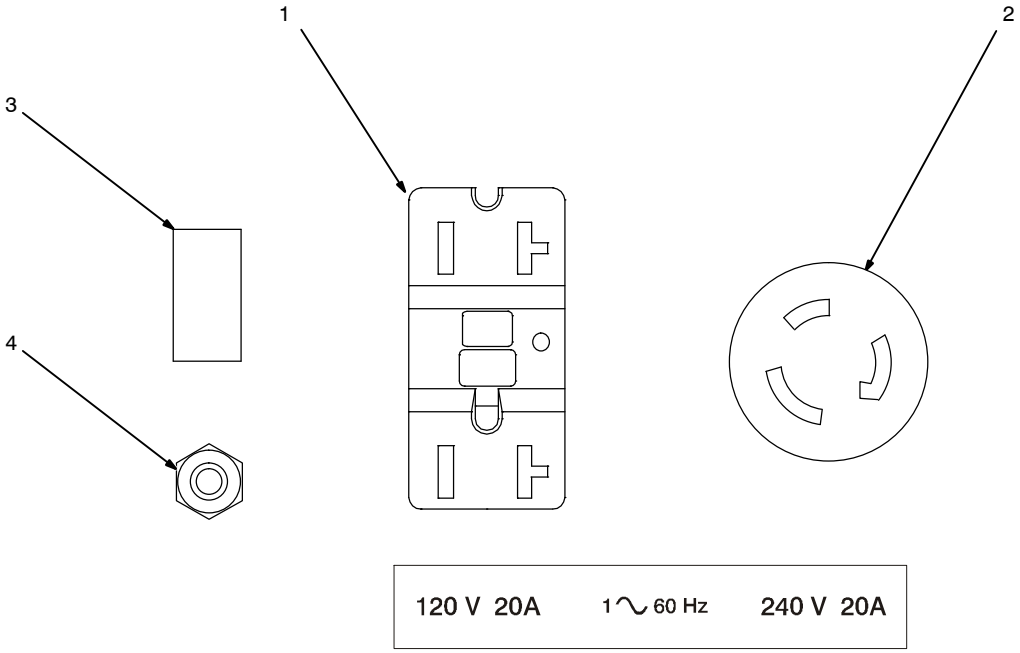
2 Timer Control LED

Verify dryer solenoid is functioning by listening for dryer canisters to purge, or by checking solenoid LED. LED lights at start-up and every two minutes when the canisters automatically purge.

803 228 / 803 229

SECTION 7 – OPERATING AUXILIARY EQUIPMENT

7-1. Domestic Auxiliary Power Receptacles



191 624

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

Unplug power cord before attempting to service accessories or tools.

1 120 V 20 A AC GFCI Receptacle GFCI1

2 240 V 30 A AC Twistlock Receptacle RC1

Receptacles supply 60 Hz single-phase power at weld/power speed.

Test GFCI monthly. See Section 7-4 for GFCI information and for resetting and testing procedures.

3 Supplementary Protector CB1

4 Supplementary Protector CB2

CB1 protects RC1 and the generator winding from overload. If CB1 opens, RC1 and GFCI1 do not work. Place switch in On position to reset.

CB2 protects GFCI1 from overload. If CB2 opens, GFCI1 does not work. Press button to reset.

☞ *If a supplementary protector continues to open, contact Factory Authorized Service Agent.*

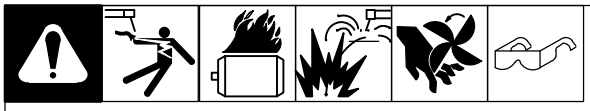
☞ *Generator power is not affected by weld output.*

Maximum output is 2.4 kVA/kW from GFCI1 and 4 kVA/kW from RC1. Maximum output from all receptacles is 4 kVA/kW.

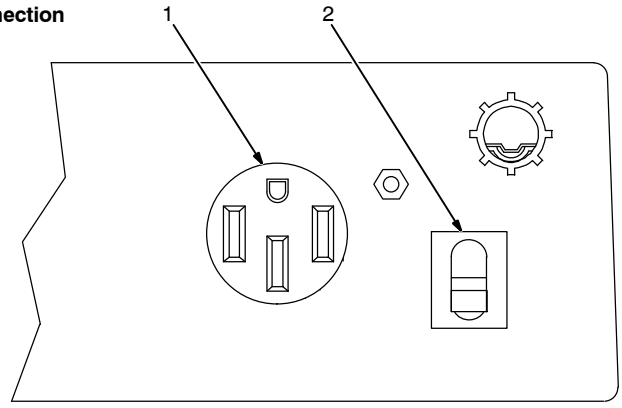
EXAMPLE: If 13 A is drawn from RC1, only 7 A is available at GFCI1:

(240 V x 13 A) + (120 V x 7 A) = 4.0 kVA/kW

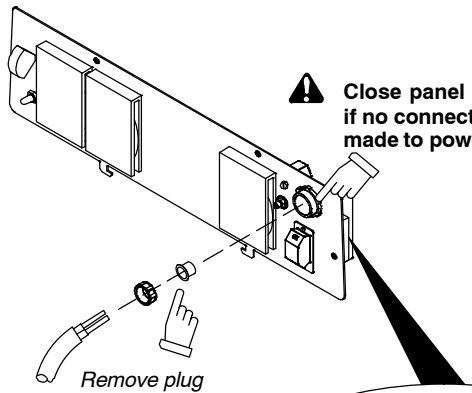
7-2. Connecting To Optional AC Power Plant



Single-Phase Power Connection



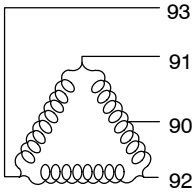
Three-Phase Power Connection

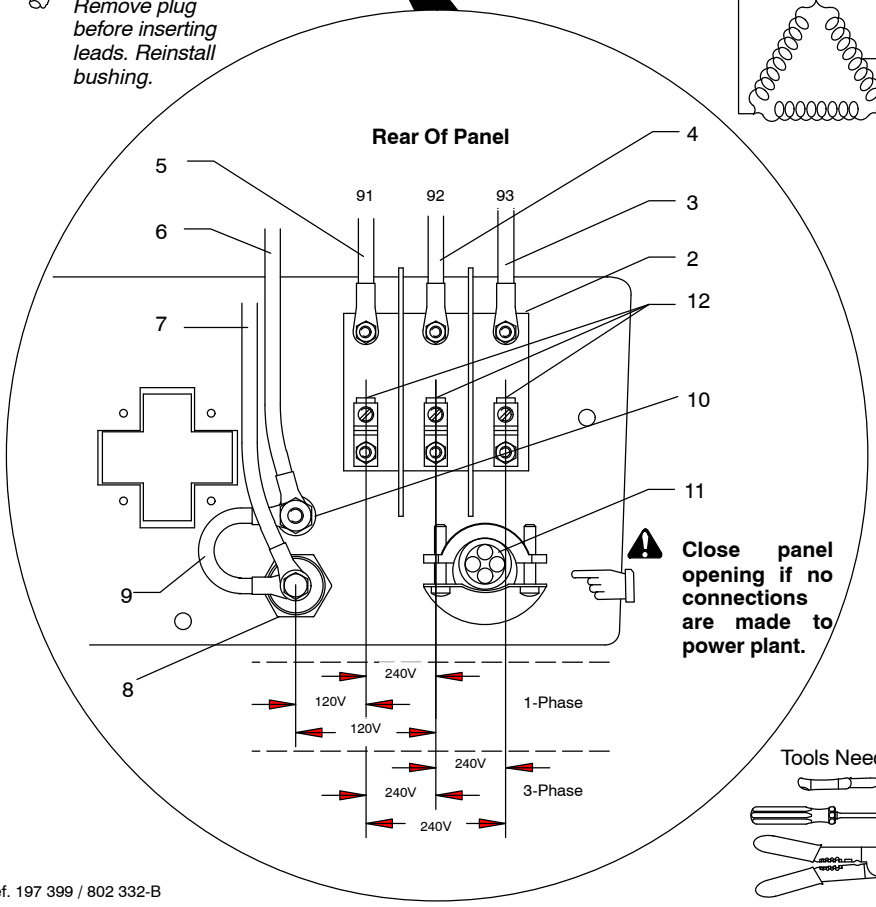


Close panel opening if no connections are made to power plant.

Remove plug before inserting leads. Reinstall bushing.

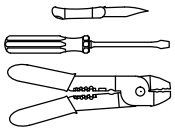
AC ∼ Output	Single Phase 1 ∼	Three Phase 3 ∼
Volts	120/240	240
Amps	50	48
KVA/KW	12	20
Frequency	60 Hz	
Engine Speed	1850 RPM	
Lead 42 connects to GROUND stud on front of unit. Jumper 42 is connected to 90 at factory.		





Close panel opening if no connections are made to power plant.

Tools Needed:



Ref. 197 399 / 802 332-B

☞ *Do not weld while using optional AC power plant.*

☞ *Place Process/Contactor switch in Weld Terminals Always On - Stick position when using optional AC power plant (see Section 6-3).*

Single-Phase Generator Power

1 120/240 V 50 A Receptacle RC5

RC5 is connected to the optional AC power plant and supplies 60 Hz single-phase power at weld/power speed. Maximum output from RC5 is 12 kVA/kW. Power available at RC5 is reduced when welding.

2 Supplementary Protector CB7

Supplementary protector CB7 protects single-phase receptacle RC5 and the load wires from overload. If CB7 opens, all generator AC output stops and the receptacle does not work.

Three-Phase Generator Power

Stop engine.

Power and weld outputs are live at the same time. Disconnect or insulate unused cables.

☞ *Have qualified person install according to circuit diagram and Generator Power Guidelines (see Section 16).*

Remove power panel mounting screws. Tilt panel forward.

3 Lead 93

4 Lead 92

5 Lead 91

6 Lead 42 (Circuit Grounding Lead)

7 Lead 90 (Neutral)

8 Isolated Neutral Terminal

9 Jumper Lead 42

10 Grounding Terminal

Jumper 42 is connected to lead 90 at factory. Jumper 42 may be disconnected from neutral to meet applicable electrical codes.

Lead 42 connects to front panel Ground stud.

11 User-Supplied Leads

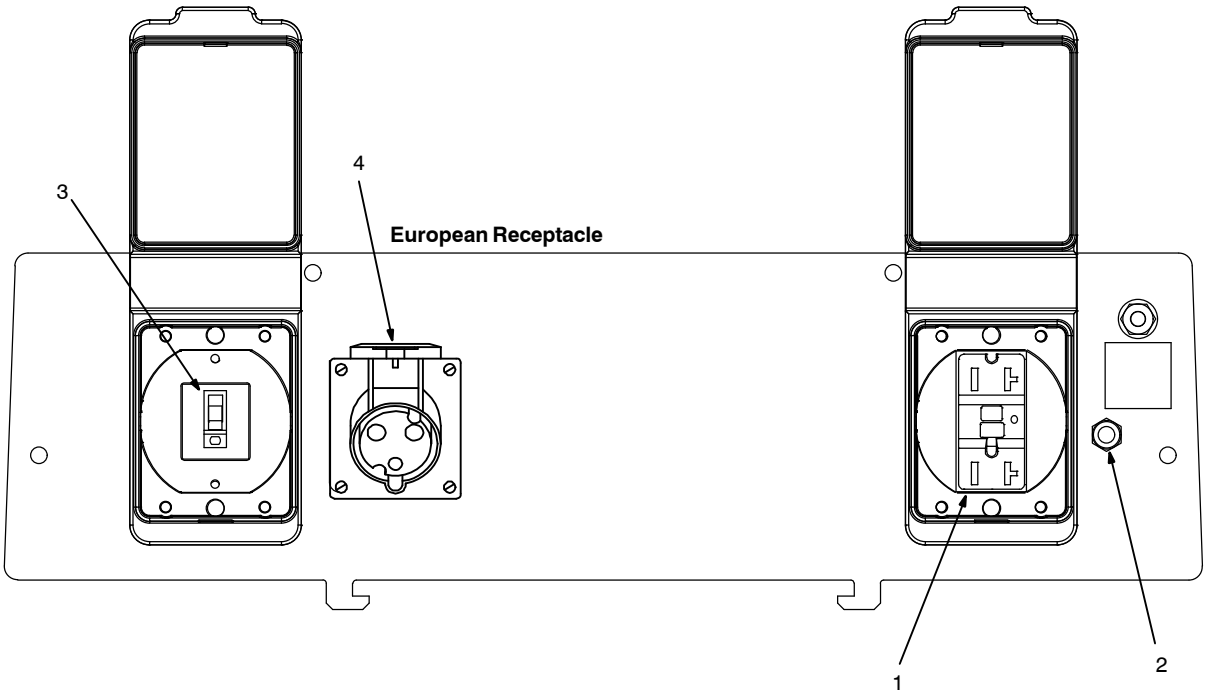
12 Supplementary Protector CB7 User Terminals

Connect user-supplied leads to terminals on CB7 and to the isolated neutral terminal and grounding terminal as necessary.

☞ *Supplementary protector CB7 protects single-phase receptacle RC5 and the load wires from overload. If CB7 opens, all AC power plant output stops and the receptacle does not work.*

Reinstall power panel.

7-3. Export Auxiliary Power Receptacles



238 127-A / 805 259-A

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

Unplug power cord before attempting to service accessories or tools.

1 120V 15/20A AC Receptacle GFCI1

Receptacle supplies 60 Hz single-phase power at weld/power speed.

Maximum output is 2.4 kVA/kW from GFCI1.

Test GFCI monthly. See Section 7-4 for GFCI information and for resetting and testing procedures.

Maximum combined output of all receptacles is 4 kVA/kW.

EXAMPLE: If 13 A is drawn from RC1, only 7 A is available at GFCI1:

(240 V x 13 A) + (120 V x 7 A) = 4.0 kVA/kW

2 Circuit Breaker CB2

CB2 protects GFCI1 from overload. If a circuit breaker opens, the receptacle does not work. Press CB2 to reset breaker.

3 Earth Leakage Circuit Breaker ELCB1

ELCB1 protects RC1 from Earth leakage fault. If circuit breaker opens the receptacle does not work. Place circuit breaker switch in the On position to reset breaker.

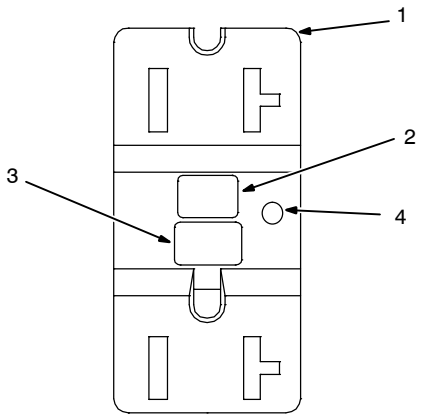
☞ *At least once a month, press test button. If ELCB is working properly, power will be disconnected. Reset breaker.*

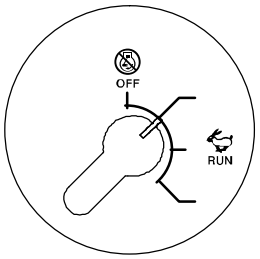
4 220V 16A AC European Receptacle RC1

Maximum output is 4 kVa/kW from RC1.

☞ *If a circuit breaker continues to open, contact Factory Authorized Service Agent.*

7-4. GFCI Receptacle Information, Resetting And Testing





Test and reset GFCI only at Run speed.

RotGFCI1 2012–05

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacle to power life support equipment.

Unplug power cord before attempting to service accessories or tools.

1 120 V 20 A AC GFCI Receptacle

2 GFCI Receptacle Test Button

3 GFCI Receptacle Reset Button

4 GFCI Indicator Light (LED)

GFCI Receptacles

GFCI receptacles protect the user from electric shock if a ground fault occurs in equipment connected to the receptacle. A ground fault occurs when electrical current takes the shortest path to ground (which could be through a person) rather than follow its intended safe path.

If a ground fault is detected, the GFCI Reset button pops out, and the circuit opens to disconnect power to the faulty equipment. A GFCI receptacle does not protect against circuit overloads, short circuits, or shocks not related to ground faults. Reset and test GFCI receptacle according to the following procedures.

Resetting/Testing GFCI Receptacle

Test GFCI monthly. See Testing GFCI Receptacle.

Do not test or reset GFCI receptacles at idle speed/low voltage or the GFCI will be damaged and not provide protection from electric shock caused by a ground fault.

If LED blinks, stop using GFCI receptacle and have it replaced by a Factory Authorized Service Agent.

Resetting GFCI Receptacles

If a GFCI fault occurs, stop engine and disconnect equipment from GFCI receptacle. Check for damaged or wet tools, cords, plugs, etc. connected to the receptacle. Start engine and operate at Run (weld/power) speed. Press GFCI Reset button. Reconnect equipment to GFCI receptacle. If GFCI Reset button pops out again, check the equipment and repair or replace if faulty.

Testing GFCI Receptacles

☞ *GFCI testing must be done with engine running at Run (weld/power) speed.*

Start engine and operate at Run (weld/power) speed.

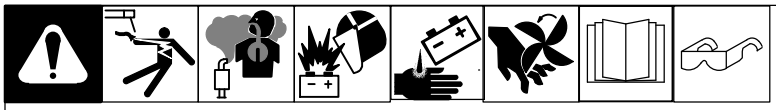
Press the GFCI Test button. The GFCI Reset button should pop out.

Press the GFCI Reset button.

Have GFCI replaced by a Factory Authorized Service Agent if any of the following occur:
GFCI does not trip when tested
LED blinks
GFCI does not reset.

SECTION 8 – OPERATING OPTIONAL BATTERY CHARGER

8-1. Battery Charging Guidelines



Stop welding generator engine. Place Output Selector switch in position matching voltage of battery being charged.

Before charging battery, read supplied BCI Battery Service Manual and the Safety Precautions at the beginning of this manual.

Have only qualified persons do battery charging work.

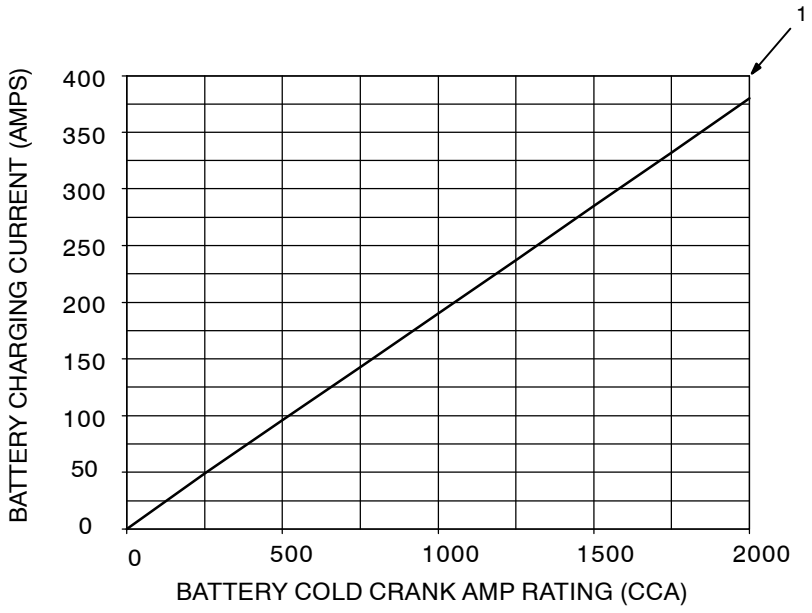
Do not charge a battery that has loose terminals or one showing damage such as a cracked case or cover.

Keep battery charging cables away from vehicle hood, door, and moving parts.

Do not use damaged battery charging cables.

Be sure charger output voltage matches battery voltage.

8-2. Determining Battery Charging Current



1 Battery Charging Current Chart

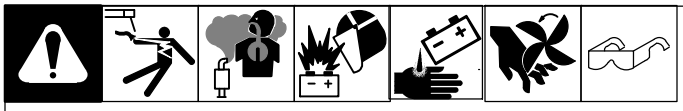
Find battery cold crank amp (CCA) rating on battery. Use CCA rating on chart to find charge current setting for battery.

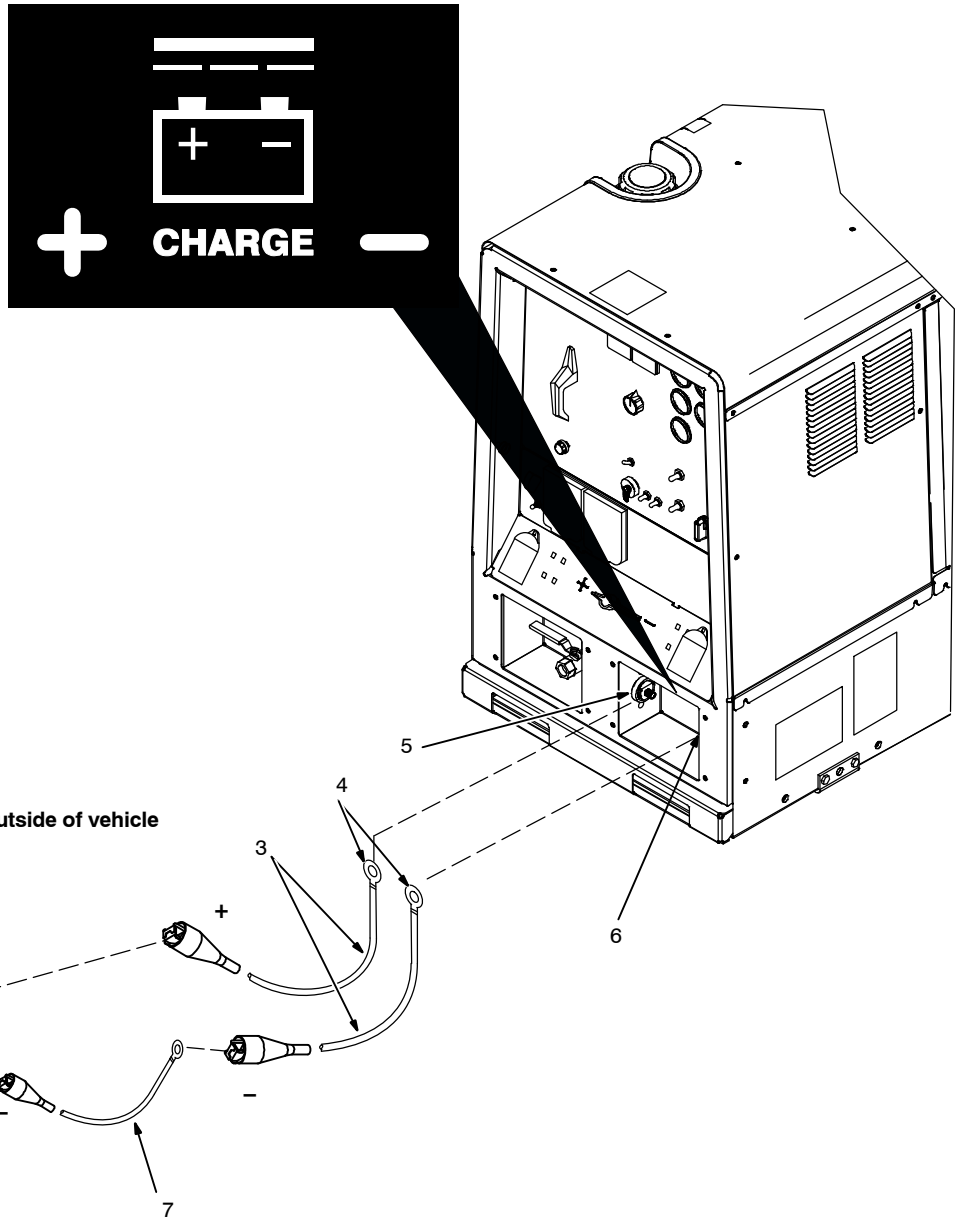
EXAMPLE: If battery CCA rating is 500, charging current from chart is 100 amperes.

Do not exceed charging current found on chart. For longer battery life, use lowest charge rate possible.

142 975-B

8-3. Connecting Uninstalled Battery To Battery Charge Output Terminals





⚠ Stop welding generator engine. Before connecting charging cables, place Output Selector switch in position matching voltage of battery being charged.

⚠ Before charging battery, check polarity of battery posts. Attach a 24 in. (60 cm) AWG 6 insulated battery cable to Negative (–) battery post. Connect charger Positive (+) cable to Positive (+) post of battery. Standing as far from battery as practical and looking away from battery, connect charger Negative (–) cable to the cable connected to the Negative (–) battery post.

1 Battery Positive (+) Terminal
2 Battery Negative (–) Terminal
3 Battery Charging Cables

Use less than 20 ft (6.1 m) of AWG #1 or larger cable.

4 Terminal Lugs

Use lugs of proper amperage capacity and hole size for connecting to charge output terminals.

Install suitable connectors on remaining ends of battery cables.

5 Battery Charge Positive (+) Output Terminal
6 Battery Charge Negative (–) Output Terminal
7 Insulated Battery Cable (Customer-Supplied)

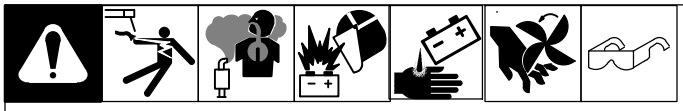
Connect a 24 in. (60 cm) or longer insulated battery cable (AWG 6) to negative (–) battery post.

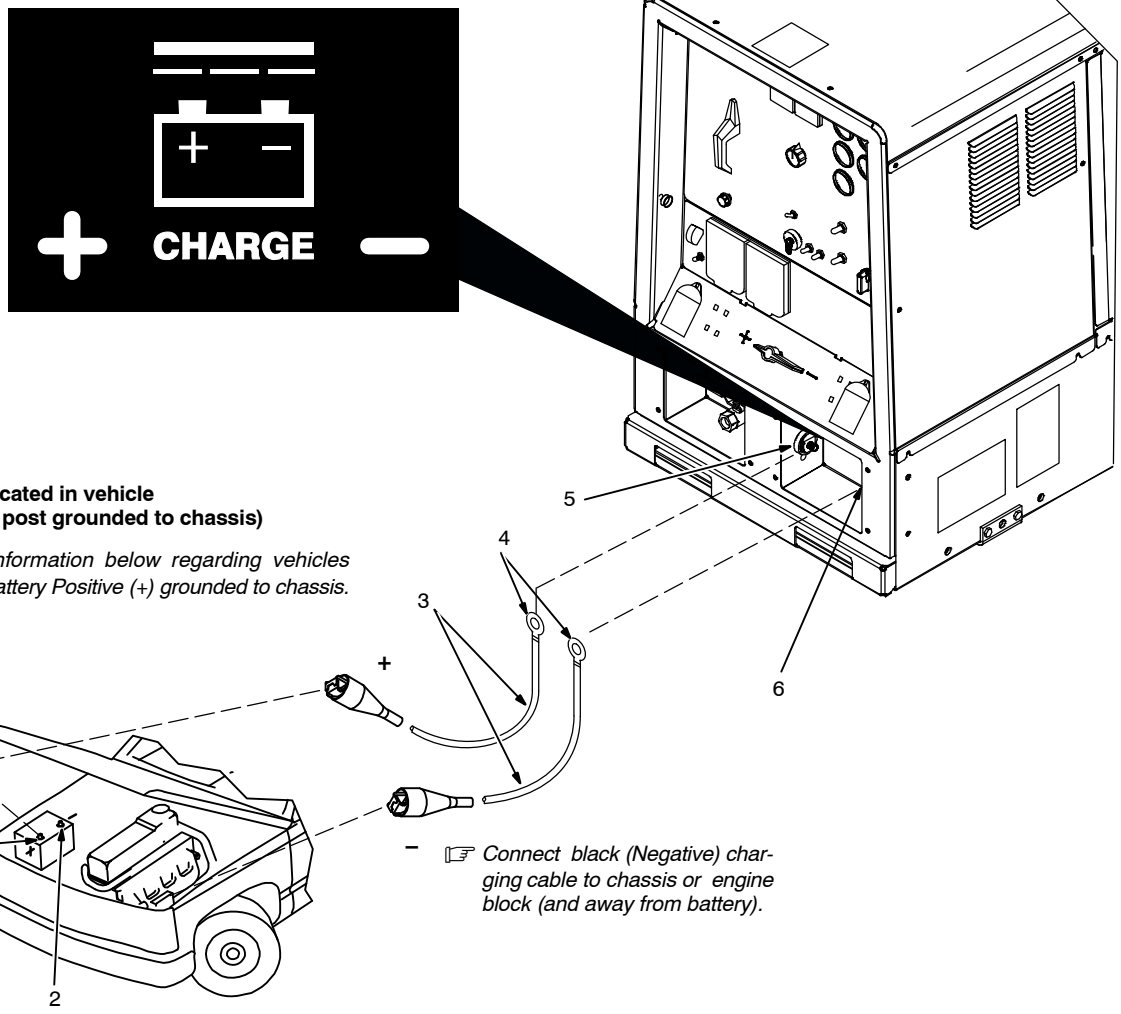
Connect positive (+) battery charging cable to positive (+) battery charging terminal.

Connect negative (–) battery charging cable to negative (–) battery charging terminal.

Connect positive (+) battery charging cable to battery positive (+) post. Connect negative (–) battery charging cable to insulated battery cable.

8-4. Connecting Installed Battery To Battery Charge Output Terminals





Battery located in vehicle
(Negative post grounded to chassis)

☞ *See information below regarding vehicles with battery Positive (+) grounded to chassis.*

☞ *Connect black (Negative) charging cable to chassis or engine block (and away from battery).*

⚠ **Stop welding generator engine. Before connecting charging cables, place Output Selector switch in position matching voltage of battery being charged.**

⚠ **Before charging battery, check polarity of battery posts. If battery Negative (–) post is grounded to chassis (most vehicles), connect charger Positive (+) cable to Positive (+) ungrounded post of battery. Connect charger Negative (–) cable to vehicle engine block or heavy gauge metal part of frame (and away from battery). If Positive (+) post is grounded to chassis, connect charger Negative (–) cable to Negative (–) ungrounded post of battery. Connect charger Positive (+) cable to vehicle chassis or engine block (and away from battery).**

1 Battery Positive (+) Terminal

2 Battery Negative (–) Terminal

3 Battery Charging Cables

Use less than 20 ft (6.1 m) of AWG #1 or larger cable.

4 Terminal Lugs

Use lugs of proper amperage capacity and hole size for connecting to charge output terminals.

Install suitable connectors on remaining ends of battery cables.

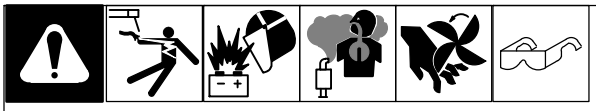
5 Battery Charge Positive (+) Output Terminal

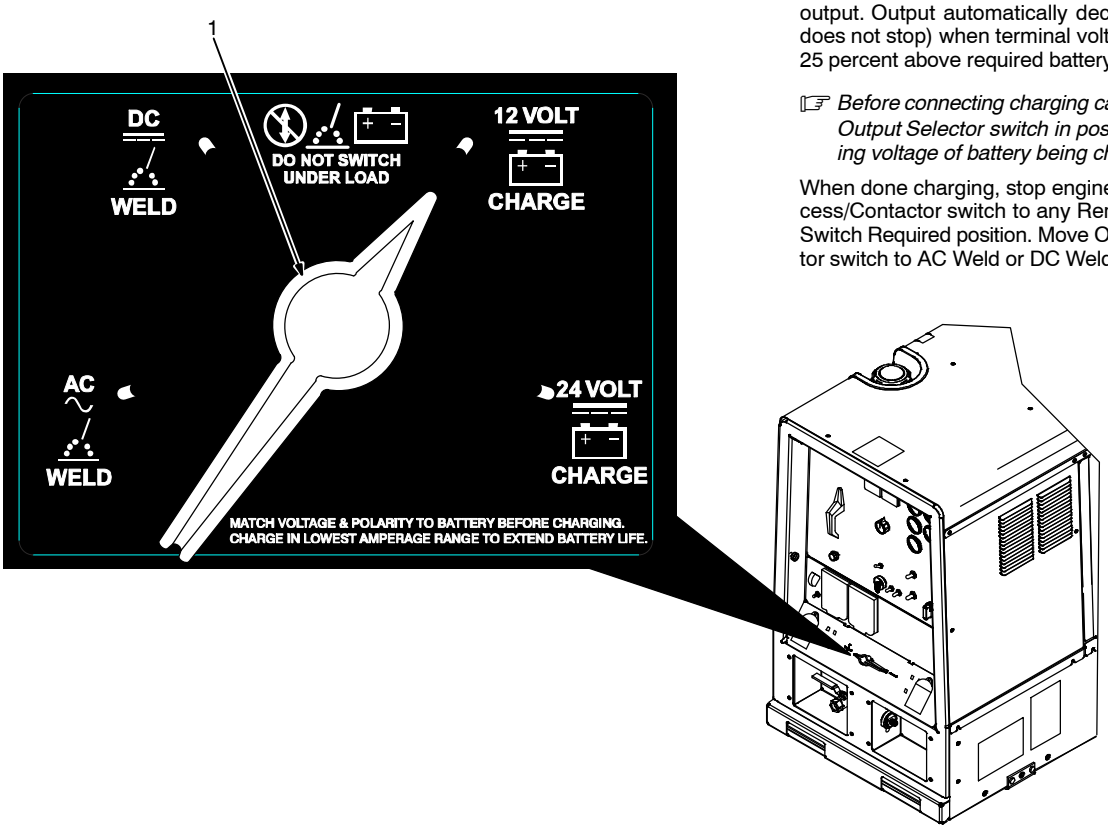
6 Battery Charge Negative (–) Output Terminal

If battery Negative (–) post is grounded to chassis, connect Positive (+) battery charging cable to battery Positive (+) post. Connect Negative (–) battery charging cable to engine block or heavy gauge metal part of frame (and away from battery).

If battery Positive (+) post is grounded to chassis, connect Negative (–) battery charging cable to battery ungrounded Negative (–) post. Connect Positive (+) battery charging cable to engine block or heavy gauge metal part of frame (and away from battery).

8-5. Battery Charge Controls





1 Output Selector Switch

NOTICE *– Do not switch under load. Stop engine or set Process/Contactor switch to any Remote position before switching.*

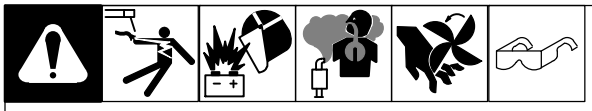
Use switch to select weld or battery charge output. Output automatically decreases (but does not stop) when terminal voltage is 15 to 25 percent above required battery voltage.

☞ *Before connecting charging cables, place Output Selector switch in position matching voltage of battery being charged.*

When done charging, stop engine or set Process/Contactor switch to any Remote On/Off Switch Required position. Move Output Selector switch to AC Weld or DC Weld position.

803 231 / 210 149-B

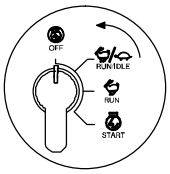
8-6. Battery Charging Procedure



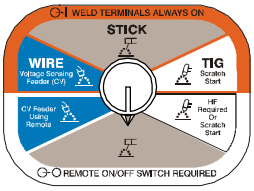
In Example:
Battery Voltage = 12 Volts
Battery CCA Rating = 500
Charge Current = 100 A (See Section 8-2)
Ampere Range Setting = 55 to 125 A
V/A Control Setting = Any Position

☞ *This battery charging procedure uses the front panel controls to turn charging output on and off.*

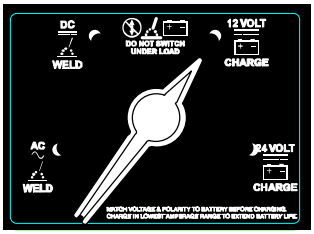
⚠ **Have only qualified persons charge batteries.**



Stop Engine.

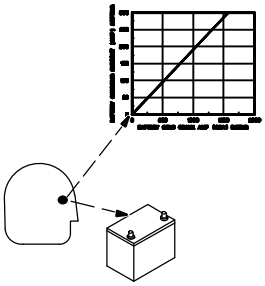


Set Process/Contactor Switch To Any Remote On/Off Switch Required Position.

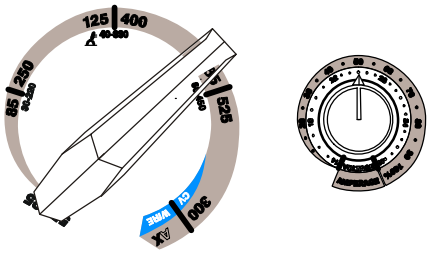


Set Output Selector Switch To Voltage Of Battery Being Charged (12 Or 24 Volt).

NOTICE – *Do not switch under load.*

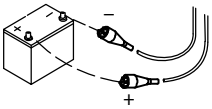


Determine Charge Current From Battery CCA Rating And Chart (See Section 8-2).

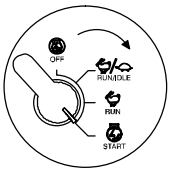


Set Ampere Range Switch And Voltage/ Amperage Adjust Control To Lowest Setting That Exceeds Charge Current.

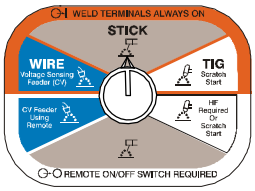
NOTICE – *Do not switch under load.*



Connect Cables. Observe Correct Polarity (See Sections 8-3 And 8-4).

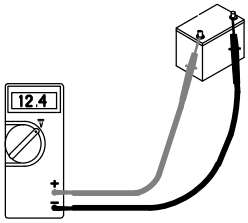


Start Engine.



Set Process/Contactor Switch To Any Weld Terminals Always On Position To Begin Charging.

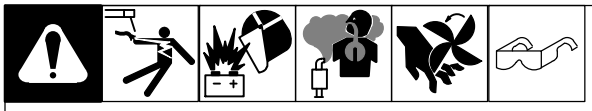
☞ *To control battery charging output using a remote device connected to the Remote 14 receptacle, keep Process/Contactor switch in Remote On/Off Switch Required position and use remote device to turn charging output on and off.*



Charge 10 minutes. Check Battery Voltage. Continue Charging If Necessary.

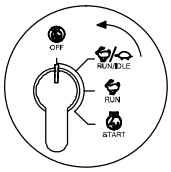
⚠ **Stop engine when finished Charging. Stand as far from battery as practical and disconnect cables from welding generator. Remove cables from battery, negative (–) cable first.**

8-7. Jump Starting Procedure

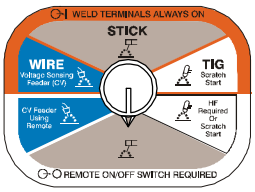


Charge battery for 10 minutes before jump starting battery.

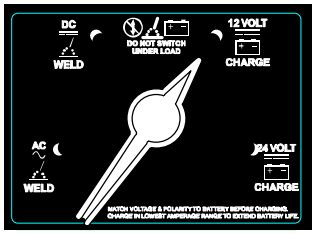
Have only qualified persons jump batteries.



Stop Engine.

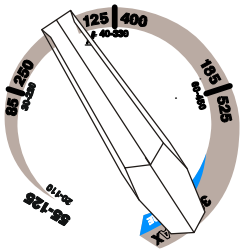


Set Process/Contactor Switch To Any Remote On/Off Switch Required Position.



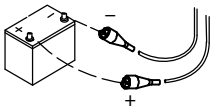
Set Output Selector Switch To Voltage Of Battery Being Charged (12 Or 24 Volt).

NOTICE *– Do not switch under load.*

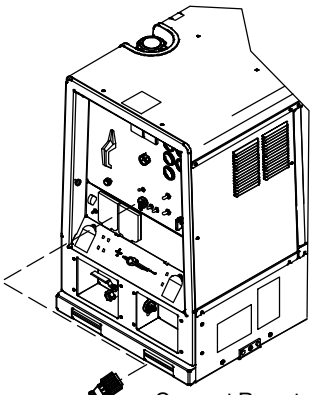


Set Ampere Range Switch To 300-Max Position.

NOTICE *– Do not switch under load.*

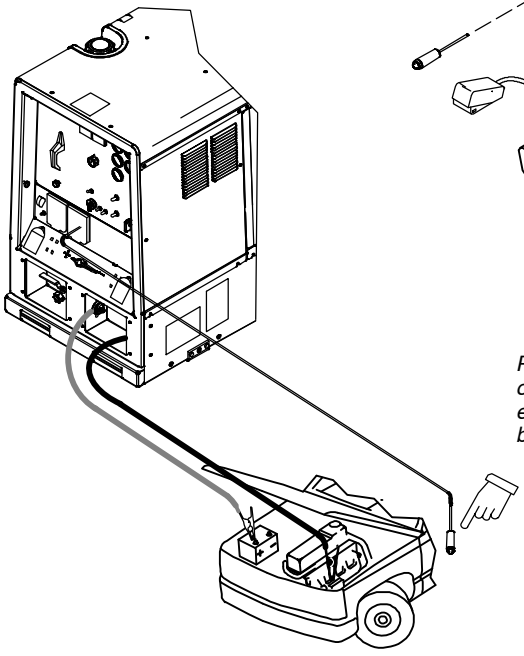


Connect Cables. Observe Correct Polarity (See Sections 8-3 And 8-4).

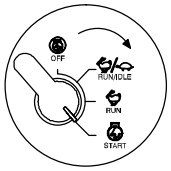


OR

Connect Remote Control Device (Momentary-On Switch).

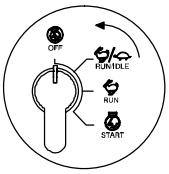


Press (close) switch only while cranking engine of equipment being started.



Start Engine.

Press (Close) Remote Momentary-On Switch While Cranking Engine Of Equipment Being Jump Started. Release Switch When Equipment Starts. Stop Welding Generator And Disconnect Cables.



Stop engine when finished jumping. Stand as far from battery as practical and disconnect cables from welding generator. Remove cables from battery, negative (–) cable first.

9-1. Engine Maintenance Label

DEUTZ

DEUTZ Service:

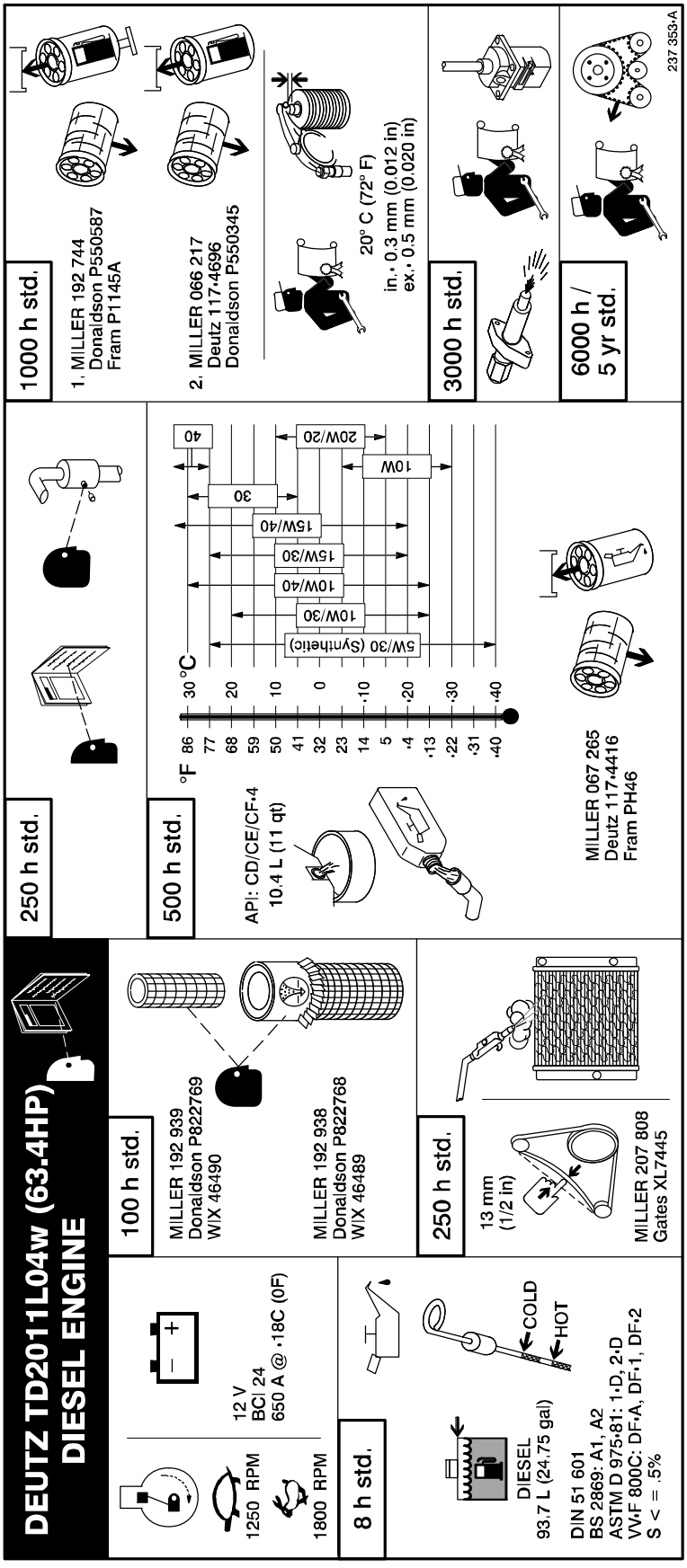
http://www.deutzamericas.com

To ensure rapid, efficient service support, you should initially contact your nearest DEUTZ service distributor or dealer: http://www.deutzamericas.com/deutznew/distributors/index.htm.

They are staffed with highly qualified parts, service and engine specialists to handle your different needs.

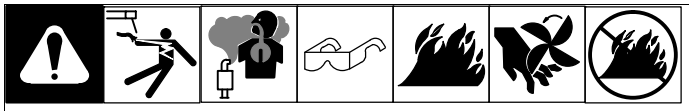
The DEUTZ Service Desk enhances this support and can be contacted by completing and submitting the Service Support Form. Customer in the US and CANADA can also contact the service desk by calling our toll free number, 1-800-241-9886.
Our normal hours of operation are from 8:00 AM to 6:00 PM Monday through Friday EST. You may contact our on call service 24 hours, 7 days a week. We ask that when you contact us, please have available or provide specific engine information (serial number, model number etc.) as shown on the Service Support Form.

NOTICE – Engine oil capacity is 11 qt (10.4 L) at oil change and 18 qt (17.0 L) total (including oil cooler).



9-2. Routine Engine/Generator Maintenance

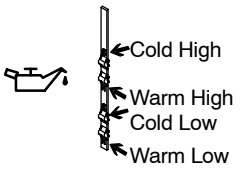
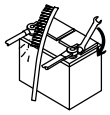
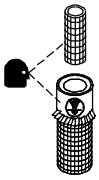
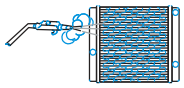
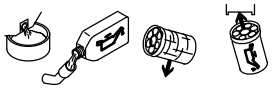
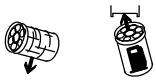
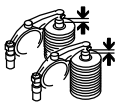
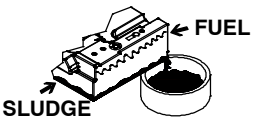
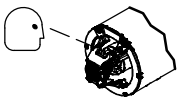
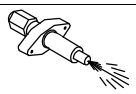
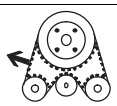
☞ *See Section 10 for air compressor maintenance information.*



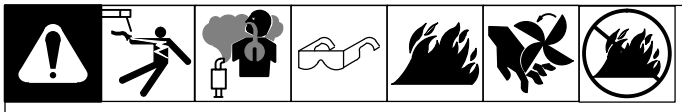
Recycle engine fluids.

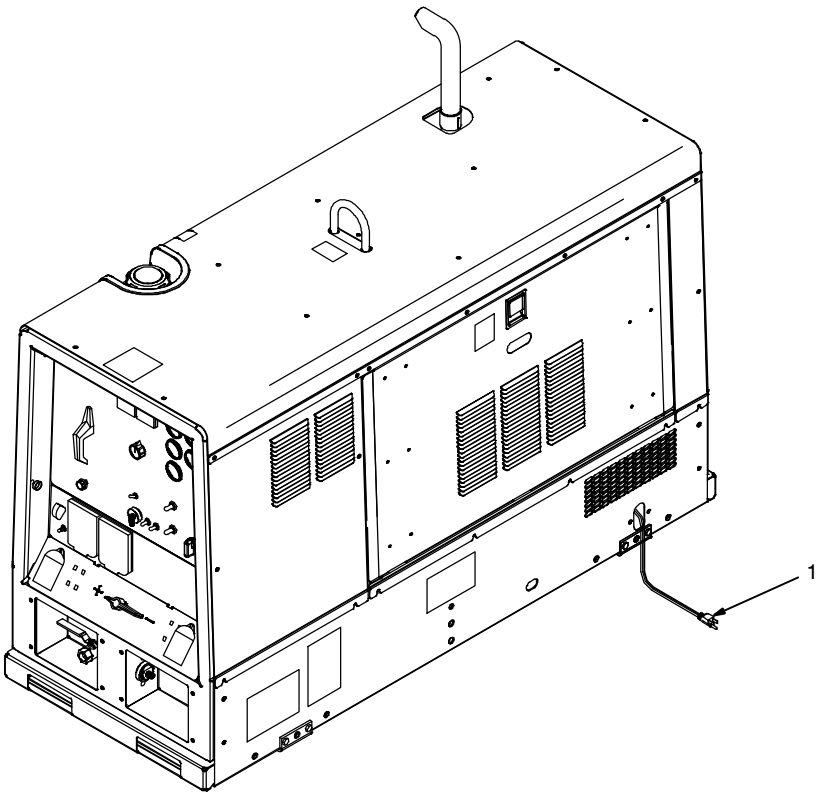
Stop engine before maintaining.

☞ *See Engine Manual and Maintenance Label for important start-up, service, and storage information. Service engine more often if used in severe conditions.*

	✓ = Check ◇ = Change ◯ = Clean ☆ = Replace * To be done by Factory Authorized Service Agent				Reference
Every **8** Hours	 ✓ Fuel/Water Separator	 ✓ Fuel Level	 ✓ Oil Level	 ◯ Oil, Fuel Spills	Section 5-8, 9-1
Every **50** Hours	 ◯ Weld Terminals				
Every **100** Hours	 ◯ Battery Terminals	 ✓ Air Cleaner Hoses	 ✓ Air Cleaner Element		Section 9-5
Every **250** Hours	 ☆ Unreadable Labels	 ✓ Fan Belt Tension	 ◯ Cooling System	 ✓◯Spark Arrestor	Engine Manual, Section 9-6
Every **500** Hours	 ✓☆ Weld Cables	***NOTICE*** *– Change engine oil and filter after initial 50 to 75 hours of use.*  ◇ Oil ◇ Oil Filter			Section 9-1
Every **1000** Hours	 ◇ Fuel Filter	 ◯ Inside Unit	 ✓Valve Clearance*	 ◯ Drain Sludge	Section 9-1, 9-4, 9-8, and Engine Manual
	 ✓◯ Slip Rings* ✓☆ Brushes*				
Every **3000** Hours	 ◯ Injectors*				
Every **6000** Hours or 5 Years	 ✓☆ Engine Timing Belt				

9-3. Operating Optional Oil Pan Heater





1 Optional Oil Heater Plug

Use heater to maintain a constant engine oil temperature.

To turn on heater, connect heater plug to 120 volts AC receptacle. Heater is rated at 300 watts.

Do not run engine while oil pan heater is on.

NOTICE *–In extremely cold weather, heater should be connected to power source when engine oil is warm to eliminate possibility of oil coking on heater.*
Severe coking on heater element may cause damage to engine, engine oil, and oil pan heater.

The area near the the oil pan heater gets hot.

Disconnect plug to turn off heater.

Oil Heater1 2012–05 803 231 / Ref. 803 145

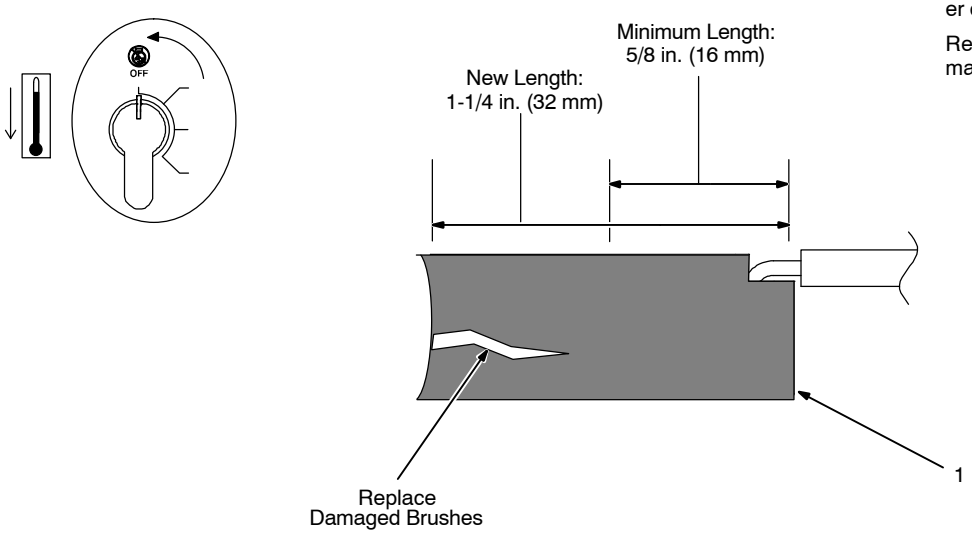
9-4. Checking Generator Brushes

Stop engine and let cool.

1 Generator Brush

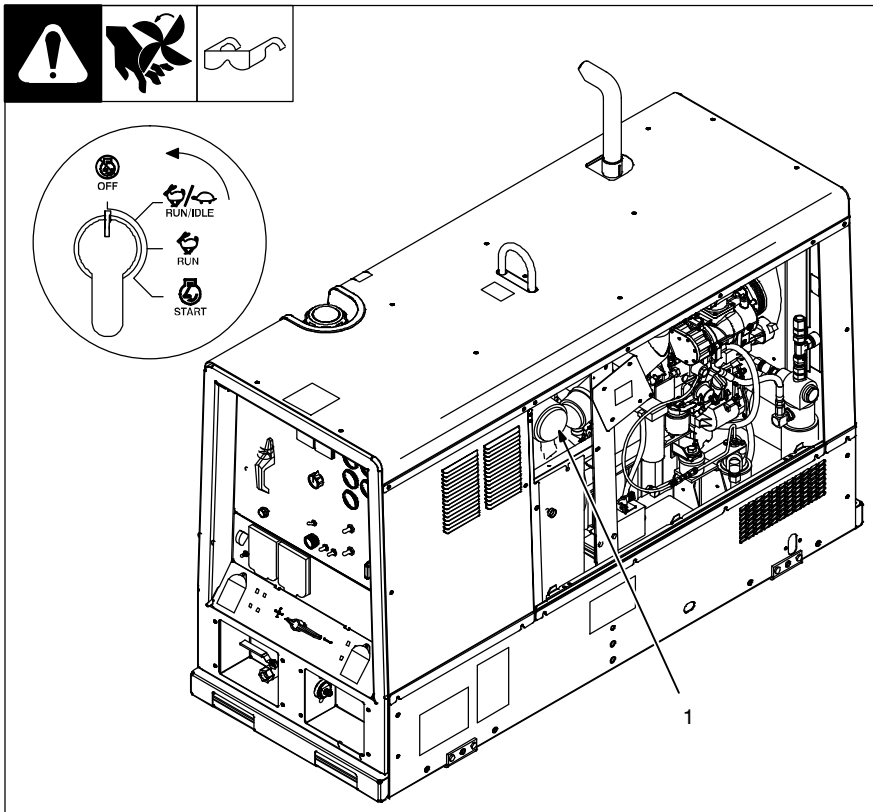
Mark and disconnect leads at brush holder cap. Remove brushes.

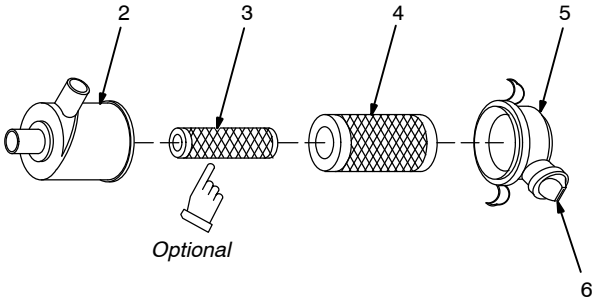
Replace brushes if damaged or if brush material is at or near minimum length.

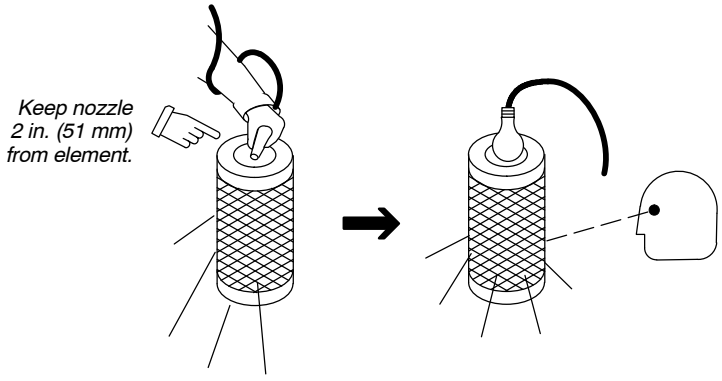


GenBrush1 2012–05 / Ref 190 823

9-5. Servicing Engine Air Cleaner







Stop engine.

NOTICE *– Do not run engine without air cleaner or with dirty element. Engine damage caused by using a damaged element is not covered by the warranty.*

1 Engine Air Cleaner

☞ *The air cleaner primary element can be cleaned but the dirt holding capacity of the filter is reduced with each cleaning. The chance of dirt reaching the clean side of the filter while cleaning and the possibility of filter damage makes cleaning a risk. Consider the risk of unwarrantable equipment damage when determining whether to clean or replace the primary element.*

If you decide to clean the primary element, we strongly recommend installing an optional safety element to provide additional engine protection. ***Never clean a safety element.*** *Replace the safety element after servicing the primary element three times.*

Clean or replace primary element if dirty (see note above before cleaning). **Replace** primary element if damaged. Replace primary element yearly or after six cleanings.

2 Housing

3 Safety Element (Optional)

4 Primary Element

5 Dust Cap

6 Dust Ejector

To clean air filter:

Wipe off cap and housing. Remove cap and dump out dust. Remove element(s). Wipe dust from inside cap and housing with damp cloth. Reinstall safety element (if present). Reinstall cap.

NOTICE *– Do not clean housing with air hose.*

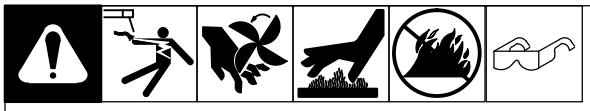
Clean primary element with compressed air only.

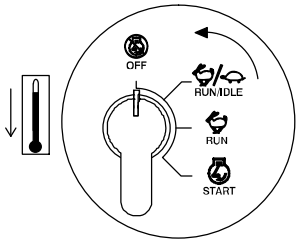
Air pressure must not exceed 100 psi (690 kPa). Use 1/8 in. (3 mm) nozzle and keep nozzle at least 2 in. (51 mm) from inside of element. Replace primary element if it has holes or damaged gaskets.

Reinstall primary element and cap (dust ejector down).

aircleaner1 9/00 – 803 228 / 153 929-B / 153 585 / Ref. S-0698-B

9-6. Inspecting/Cleaning Optional Spark Arrestor Muffler





Stop engine and let cool.

1 Spark Arrestor Muffler

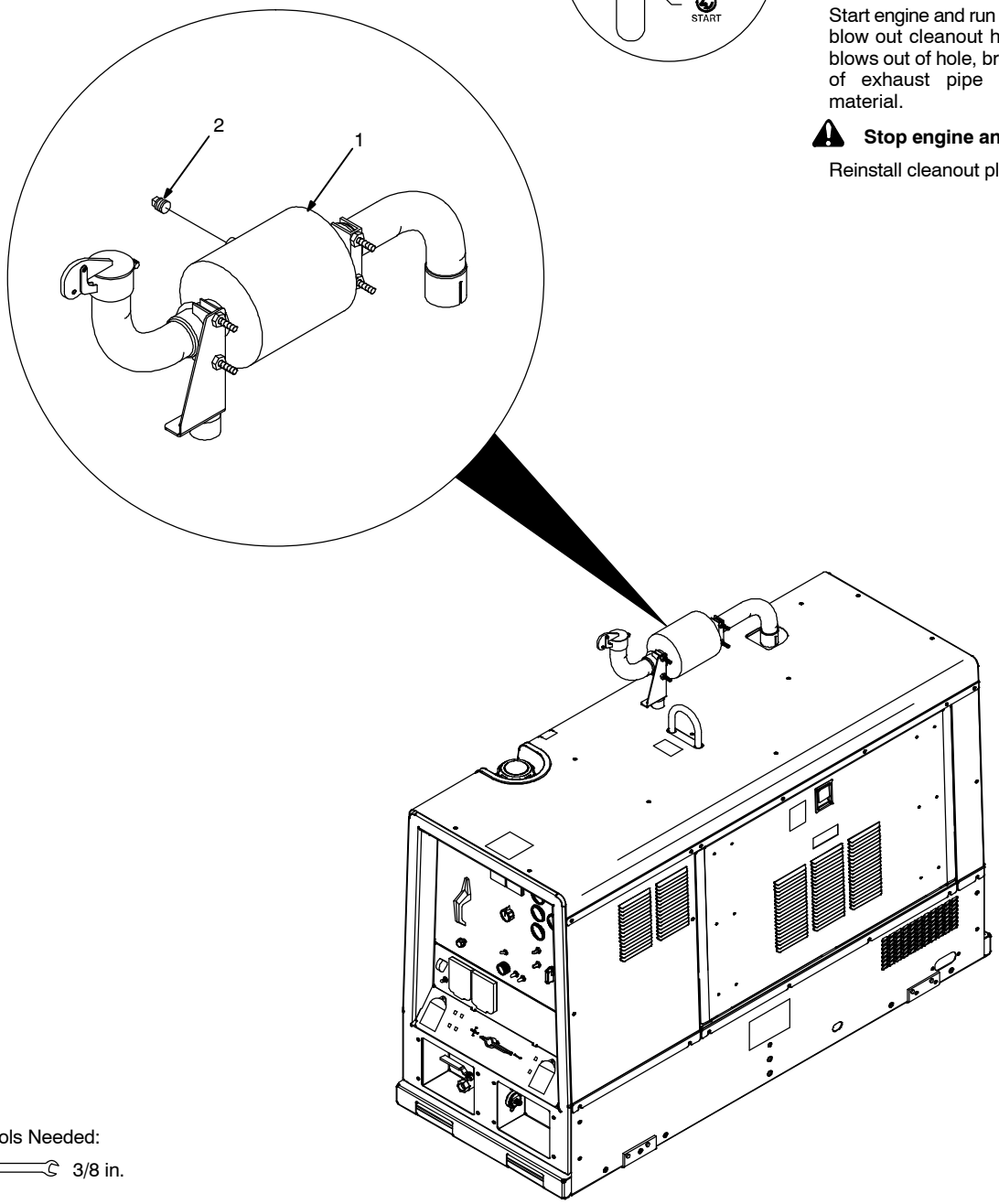
2 Cleanout Plug

Remove plug and remove any dirt covering cleanout hole.

Start engine and run at idle speed to blow out cleanout hole. If nothing blows out of hole, briefly cover end of exhaust pipe with fireproof material.

Stop engine and let cool.

Reinstall cleanout plug.



Tools Needed:

3/8 in.

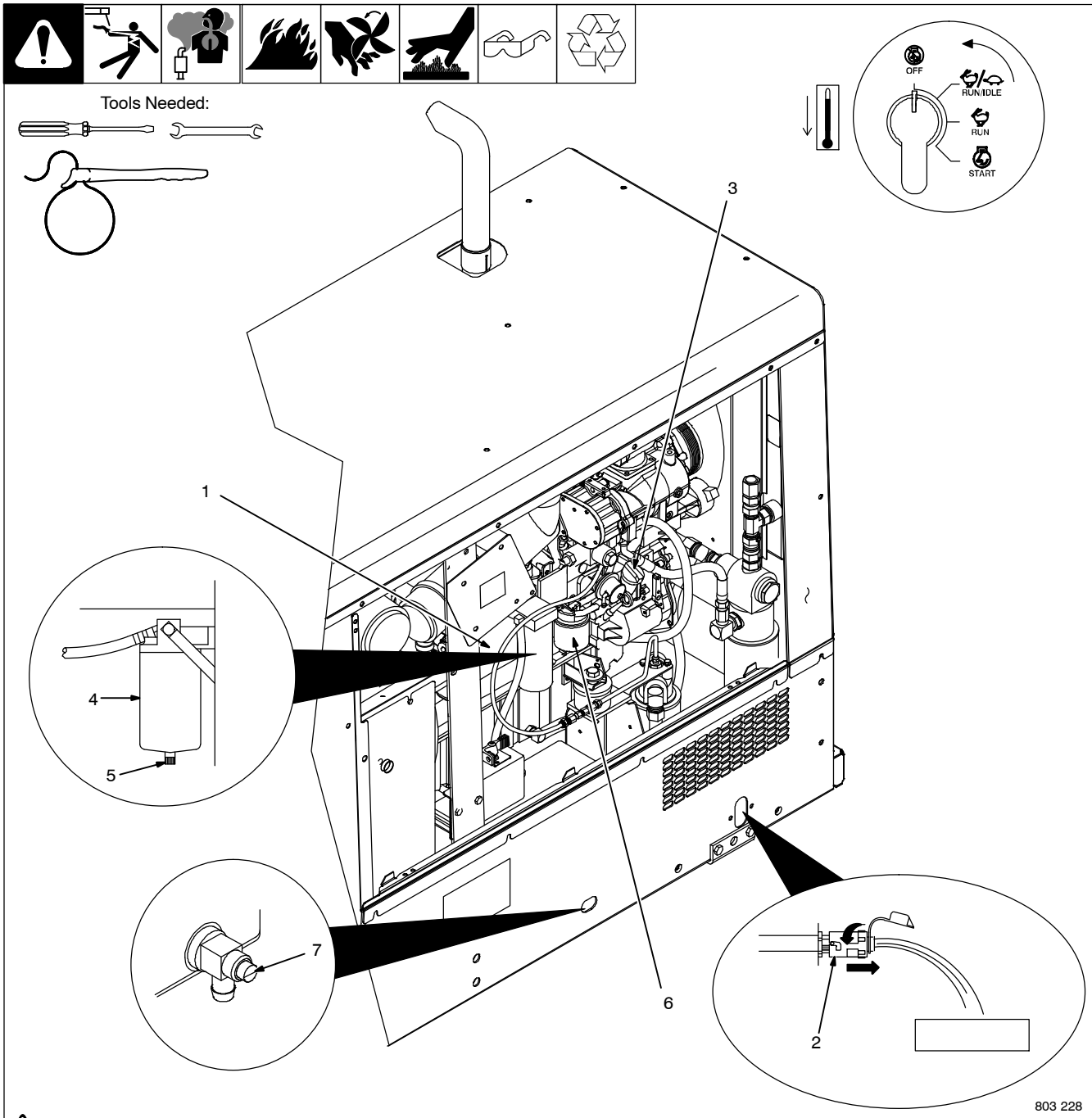
803 228 / 803 230

9-7. Engine Speed Adjustment

☞ *The engine is electronically governed and does not require engine speed adjustment. If adjustment is necessary, contact engine manufacturer's Factory Authorized Service Agent.*

☞ *For operation at high altitude (above 10,000 ft or 3,000 m), engine may require adjustment. If adjustment is necessary, contact engine manufacturer's Factory Authorized Service Agent.*

9-8. Servicing Engine Fuel And Lubrication Systems



Stop engine and let cool.

After servicing, start engine and check for fuel leaks. Stop engine, tighten connections as necessary, and wipe up spilled fuel.

1 Oil Filter
2 Oil Drain Hose And Valve
3 Oil Fill Cap
4 Primary Fuel Filter (Fuel/Water Separator)
5 Petcock
6 Secondary Fuel Filter
7 Fuel Tank Sludge Drain Valve

To change oil and filter:

☞ *The engine oil drain and compressor oil drain hoses are located together in the base. Be sure to select the correct hose when draining engine oil.*

Route engine oil drain hose through hole in base. See engine manual and engine maintenance label for oil specifications. Oil change requires 11 qt (10.4 L). Total system capacity is 18 qt (17.0 L).

To drain water from fuel system:

Open primary fuel filter petcock and drain water into metal container. Close petcock when water-free fuel flows.

To replace primary fuel filter:

Turn filter counterclockwise. Remove filter.

Apply thin coat of fuel to gasket on new filter. Fill filter with fuel. Install filter and turn clockwise until tight. Bleed air from fuel system according to engine manual.

Inspect fuel lines, and replace if cracked or worn.

To replace secondary fuel filter:

See engine manual.

Close doors.

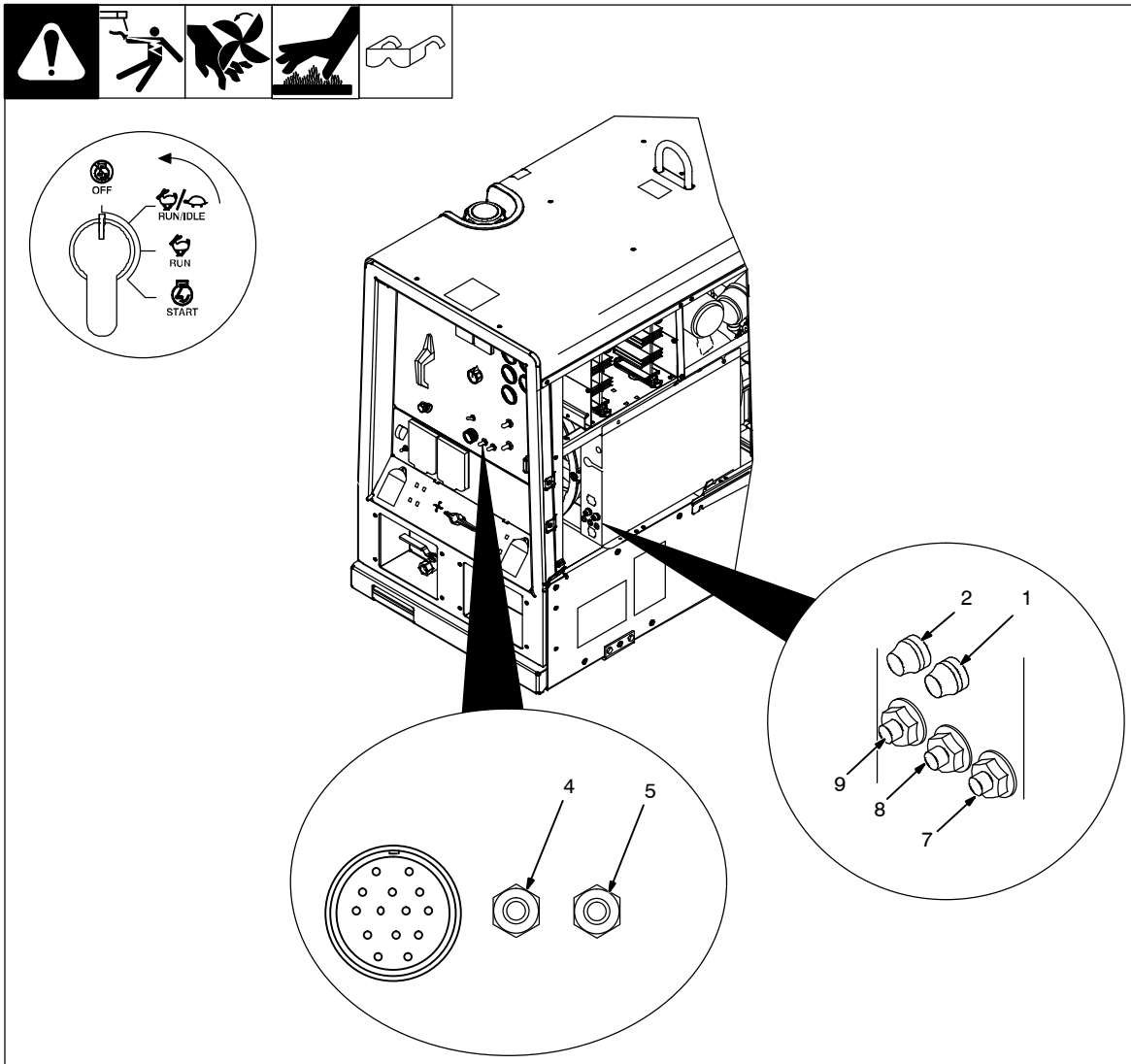
To drain sludge from fuel tank:

Beware of fire. Do not smoke and keep sparks and flames away from drained fuel. Dispose of drained fuel in an environmentally-safe manner. Do not leave unit unattended while draining fuel tank.

Properly lift unit and secure in a level position. Use adequate blocks or stands to support unit while draining fuel tank.

Attach 1/2 ID hose to drain valve. Put metal container under drain, and use screwdriver to open sludge drain valve. Close valve when sludge has drained. Remove hose.

9-9. Engine/Generator Overload Protection



803 229

Stop engine.

☞ *When a supplementary protector, circuit breaker or fuse opens, it usually indicates a more serious problem exists. Contact Factory Authorized Service Agent.*

☞ *See Section 10-4 for air compressor overload protection.*

1 Fuse F1

2 Fuse F2

F1 and F2 protect the stator exciter winding from overload. If F1 opens, weld and generator power is low or stops entirely. If F2 opens, weld output is low or stops entirely. 4 kVA/kW generator power is still available.

3 Circuit Breaker CB4 (Not Shown)

4 Supplementary Protector CB5

5 Supplementary Protector CB6

6 Circuit Breaker CB10 (Not Shown)

7 Supplementary Protector CB11

8 Supplementary Protector CB12

9 Supplementary Protector CB13

10 Circuit Breaker CB16 (Not Shown)

CB4 protects the welding arc drive (dig) circuit. If CB4 opens, electrode may stick to the workpiece more frequently during low voltage (short arc length) conditions. CB4 automatically resets when the fault is corrected.

CB5 protects the 24 volt AC output to remote receptacle RC14, and 24 volt output to field current regulator board PC1. If CB5 opens, weld output and 24 volt output to RC14 stops. On units with optional power plant, power at receptacle RC5 also stops if CB5 opens.

CB6 protects the 115 volt AC output to remote receptacle RC14. If CB6 opens, 115 volt output to RC14 stops.

CB10 protects the engine battery circuit. If CB10 opens, the engine will not crank. CB10 automatically resets when the fault is corrected.

CB11 protects the engine wiring harness. If CB11 opens, weld output stops (generator power is still available).

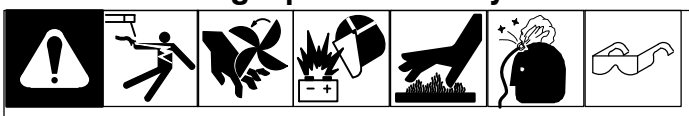
CB12 protects the field flashing circuit. If CB12 opens, the generator may not excite at start-up and weld and generator power output may not be available.

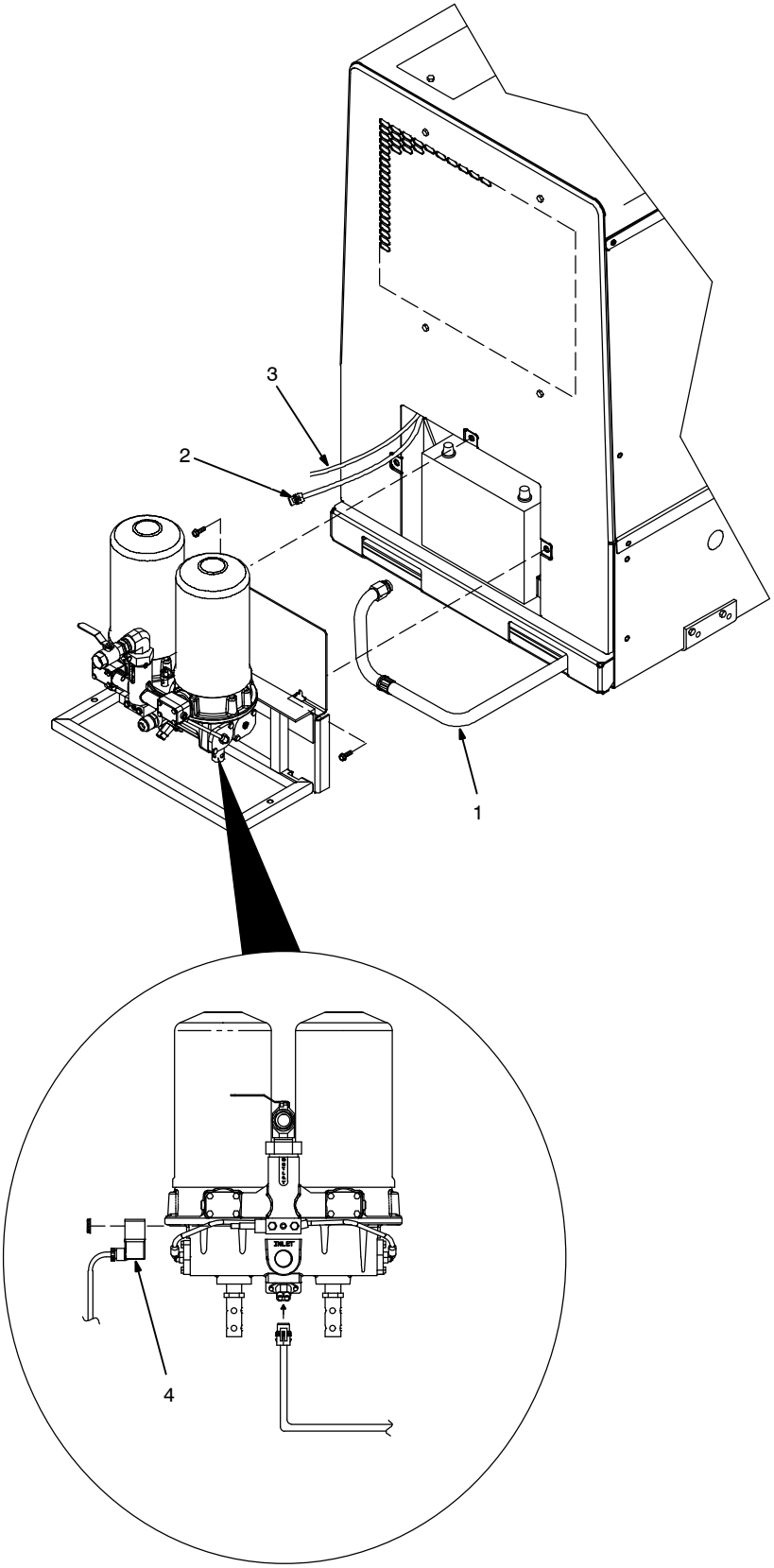
CB13 protects the engine shutdown circuit. If CB13 opens, the engine cranks but does not start.

Press button to reset.

CB16 protects the glow plug circuit. If CB16 opens, the glow plug will not operate. CB16 automatically resets when the fault is corrected.

9-10. Removing Optional Air Dryer For Service





☞ *Follow this procedure whenever the air dryer must be removed to gain access to the battery.*

1 Air Line

2 Timer Control Cable

3 Air Dryer Heater Plug

4 Solenoid LED

Disconnect air line from dryer assembly bottom inlet.

Disconnect heater cable from bottom of air dryer assembly.

Loosen hardware securing battery access panel to rear panel. Carefully pull access panel/air dryer assembly away from unit rear panel. Support dryer assembly to relieve strain on timer control cable.

Disconnect battery negative (–) cable. When service is complete, reconnect battery negative (–) cable.

Reinstall battery access panel/air dryer assembly. Reconnect air dryer heater cable.

Reconnect air line to dryer bottom inlet.

Final-tighten all hardware, and air line and air dryer fittings.

Start engine, and turn on air compressor. Check fittings for air leaks and tighten fittings if necessary.

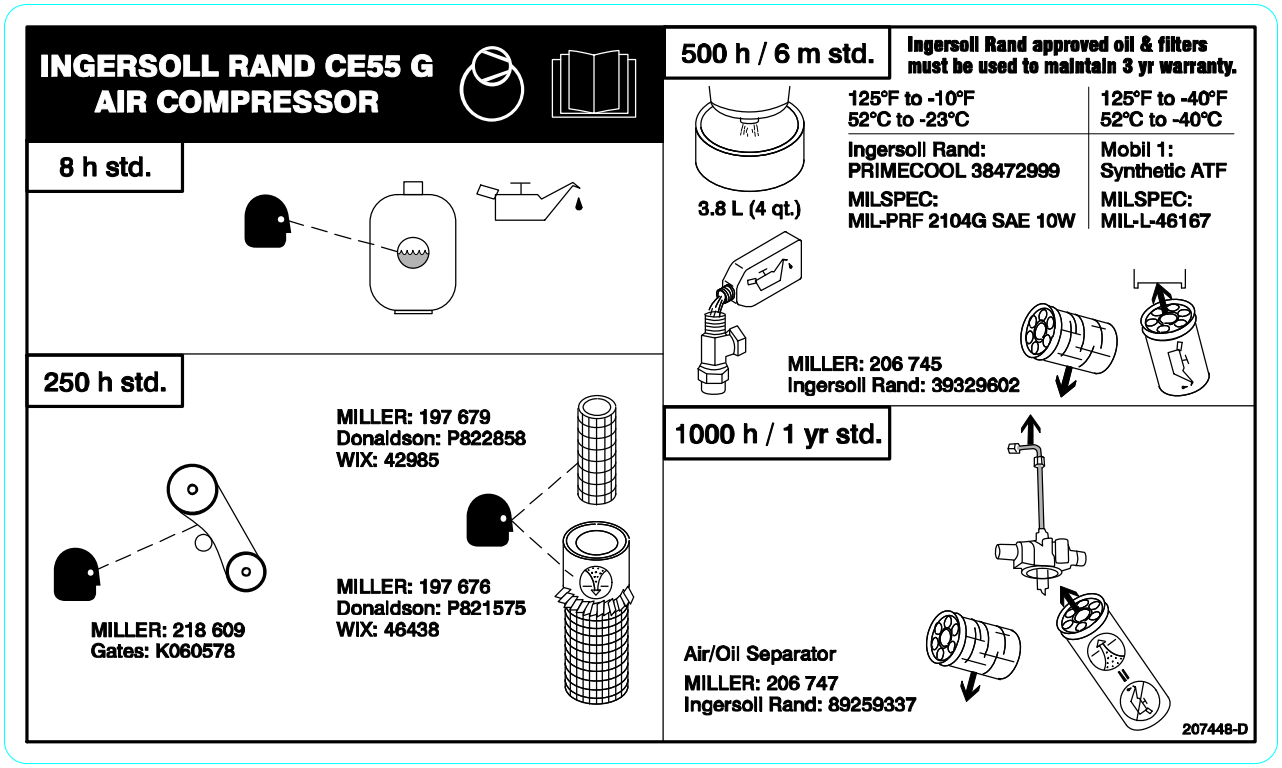
Verify dryer solenoid is functioning by listening for dryer canisters to purge, or by checking solenoid LED. LED lights at start-up and every two minutes when the canisters automatically purge.

803 511

SECTION 10 – AIR COMPRESSOR MAINTENANCE

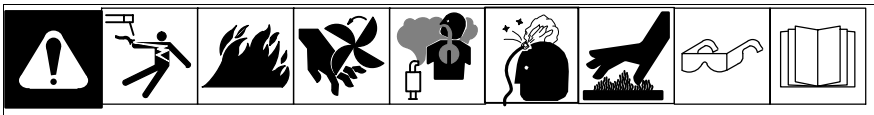
☞ *The air compressor normally requires service at the intervals listed in the maintenance schedule if used in a clean, dry environment. The compressor will require service more often if used in dirty, humid conditions.*

10-1. Air Compressor Maintenance Label



10-2. Routine Air Compressor Maintenance

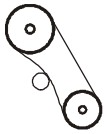
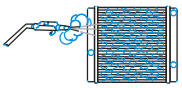
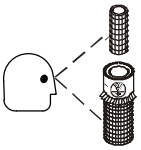
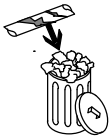
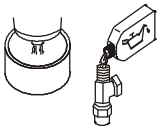
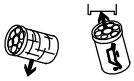
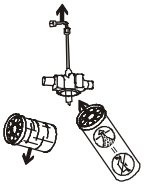
☞ *See Section 9 for engine/generator maintenance information.*



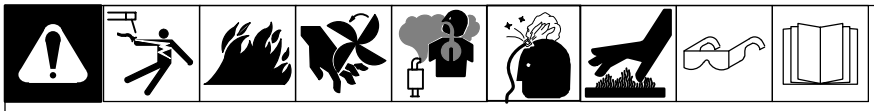
Recycle air compressor fluids.

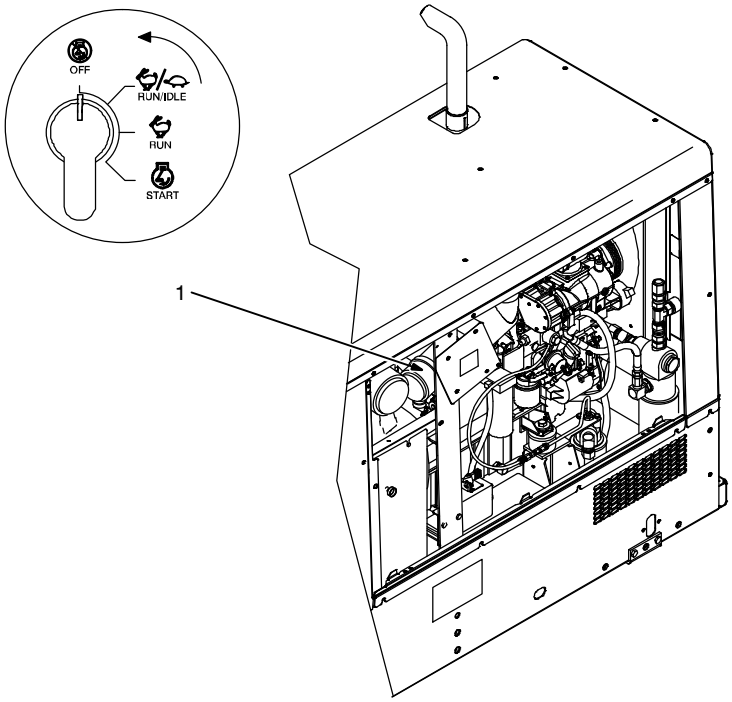
Stop engine before maintaining.

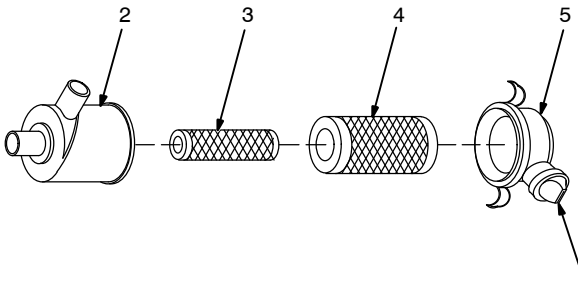
☞ *See Compressor Maintenance Label for important start-up, service, and storage information. Service air compressor more often if used in severe conditions.*

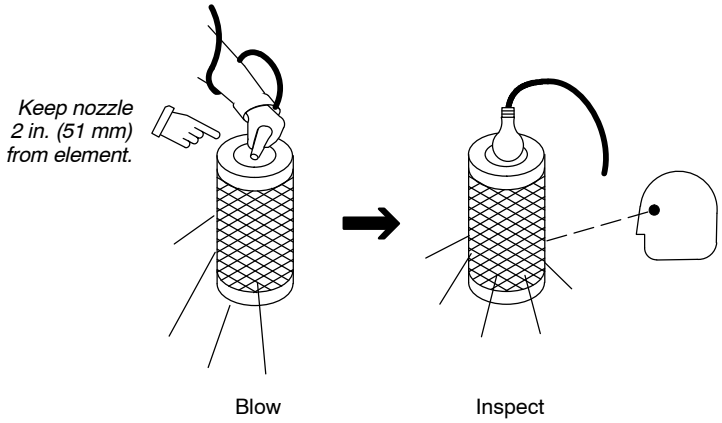
	✓ = Check ◇ = Change ◔ = Clean ☆ = Replace * To be done by Factory Authorized Service Agent				Reference
Every **8** Hours	 ◔ Spills	 ✓ Oil Level			Section 5-8
Every **100** Hours	 ✓ Air Cleaner Hoses				
Every **250** Hours	 ☆ Unreadable Labels	 ✓ Belt Tension	 ◔ Cooling System	 ✓Air Filter Element	Section 10-3
	 ☆ Worn or Damaged Air/Oil Hoses				
Every **500** Hours	 ◇ Oil	 ◇ Oil Filter			Section 10-5
Every **1000** Hours	 ◇ Air/Oil Separator				Section 10-5

10-3. Servicing Compressor Air Cleaner









Stop engine.

NOTICE *– Do not run air compressor without air cleaner or with dirty element. Compressor damage caused by using a damaged element is not covered by the warranty.*

1 Compressor Air Cleaner

☞ *Remove engine air cleaner cover and element to access compressor air cleaner (see Section 9-5)*

☞ *The air cleaner primary element can be cleaned but the dirt holding capacity of the filter is reduced with each cleaning. The chance of dirt reaching the clean side of the filter while cleaning and the possibility of filter damage makes cleaning a risk. Consider the risk of unwarrantable equipment damage when determining whether to clean or replace the primary element.*

If you decide to clean the primary element, we strongly recommend installing an optional safety element to provide additional air compressor protection. ***Never clean a safety element.*** *Replace the safety element after servicing the primary element three times.*

Clean or replace primary element if dirty (see note above before cleaning). **Replace** primary element if damaged. Replace primary element yearly or after six cleanings.

2 Housing

3 Safety Element

4 Primary Element

5 Cover

6 Dust Ejector

To clean air filter:

Wipe off cover and housing. Remove cover and dump out dust. Remove element(s). Wipe dust from inside cover and housing with damp cloth. Reinstall safety element (if present). Reinstall cover.

NOTICE *– Do not clean housing with air hose.*

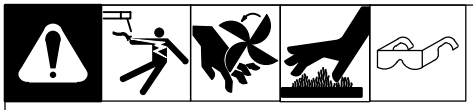
Clean primary element with compressed air only.

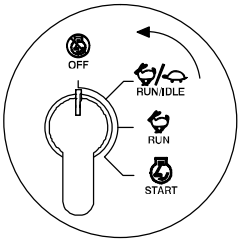
Air pressure must not exceed 100 psi (690 kPa). Use 1/8 in. (3 mm) nozzle and keep nozzle at least 2 in. (51 mm) from inside of element. Replace primary element if it has holes or damaged gaskets.

Reinstall primary element and cover (dust ejector down).

aircleaner1 9/02* – 803 228 / 153 929-B / 153 585 / Ref. S-0698-B

10-4. Compressor Overload Protection





Stop engine.

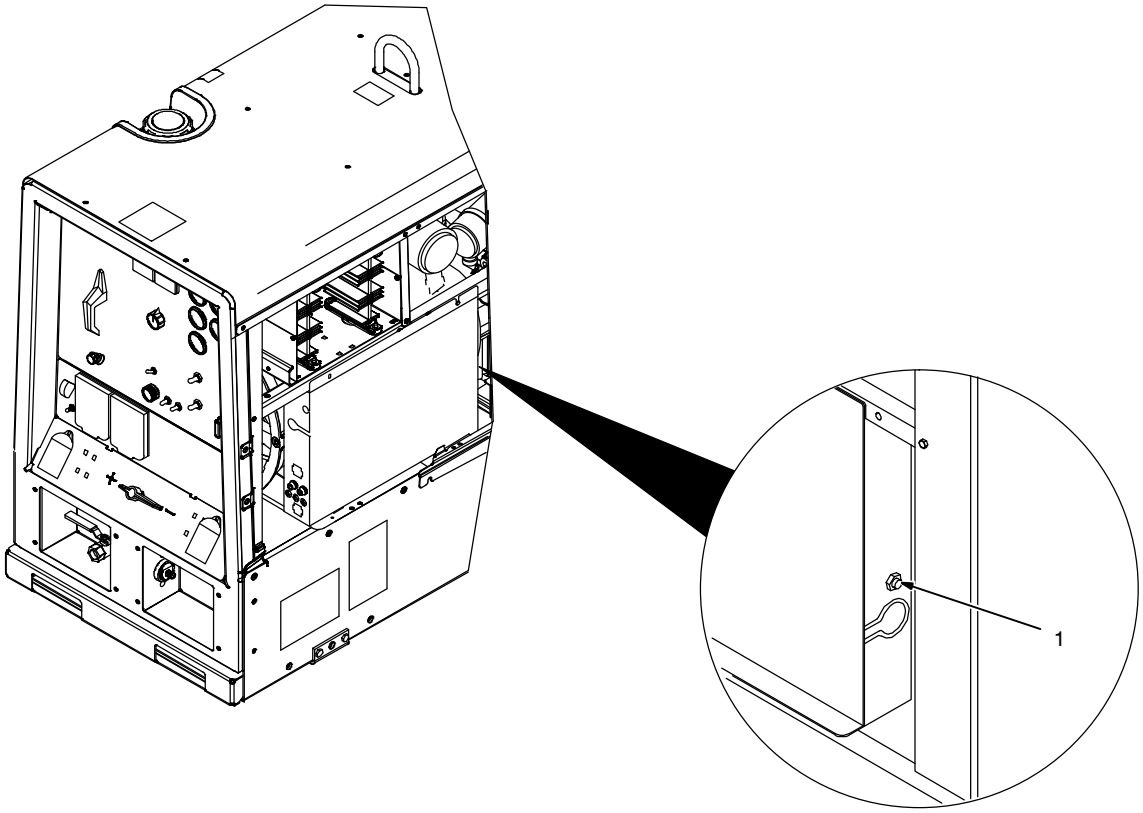
☞ *When a circuit breaker or fuse opens, it usually indicates a more serious problem exists. Contact Factory Authorized Service Agent.*

☞ *See Section 9-9 for engine/generator overload protection.*

1 Circuit Breaker CB15

Circuit breaker CB15 protects the air compressor clutch. If CB15 opens, the compressor does not run and air output stops.

Press button to reset breaker.

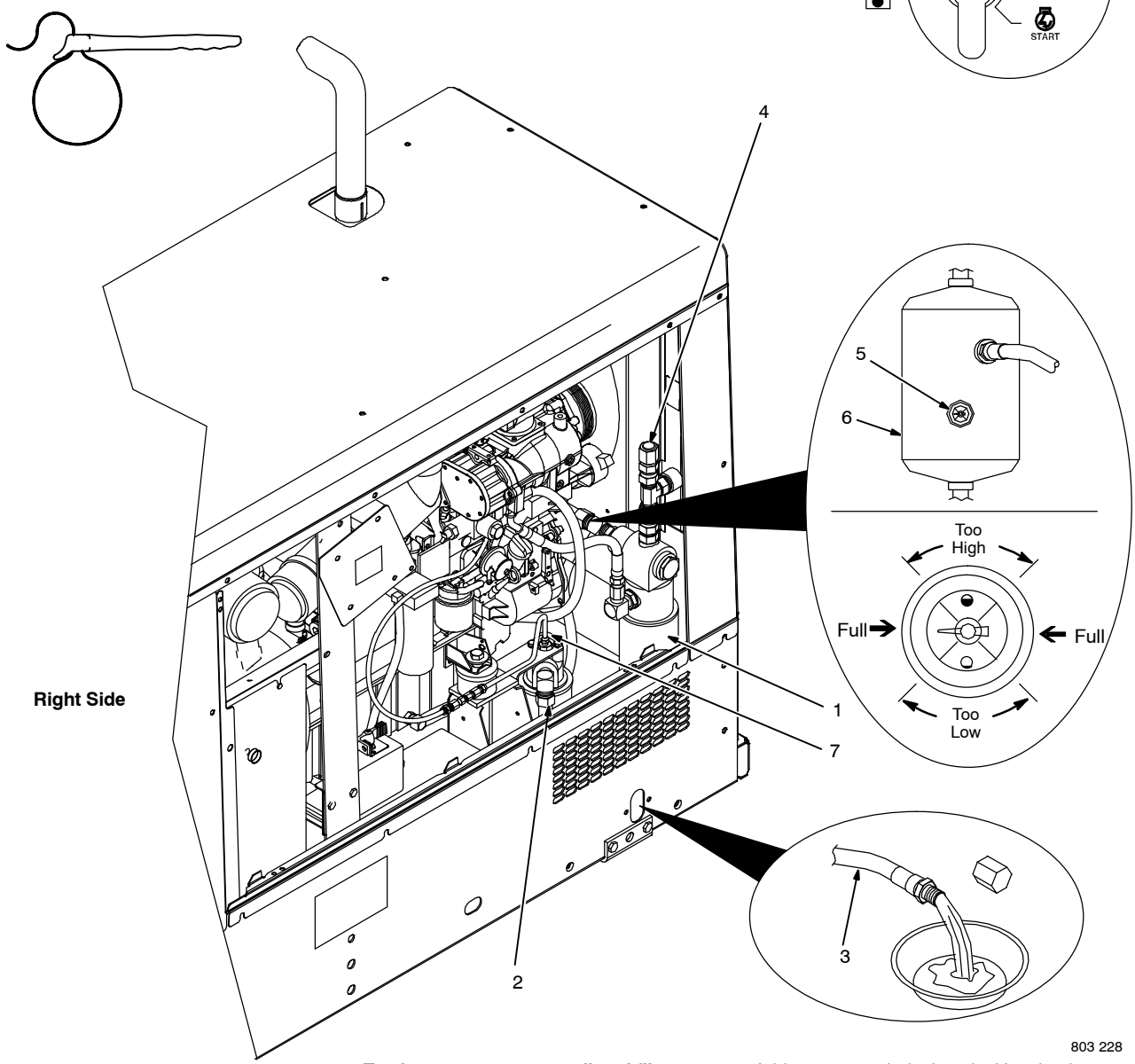


803 228 / 803 229

10-5. Servicing Air Compressor

Tools Needed:

7/8, 15/16 in.



803 228

Right Side

Stop engine and let cool. Wait 20 seconds for system pressure to drop before changing oil.

1 Air Compressor Oil Filter

2 Secondary Air Compressor Air/Oil Separator

3 Air Compressor Oil Drain Hose w/Removable Cap

4 Air Compressor Oil Fill Cap

5 Air Compressor Oil Level Indicator

6 Air Compressor Primary Air/Oil Separator Tank

7 Oil Scavenge Tube

To change compressor oil and filter:

☞ *The engine oil drain and compressor oil drain hoses are located together in the base. Be sure to select the correct hose when draining compressor oil.*

☞ *Be sure o-rings at oil drain and oil fill fittings are in place before reinstalling caps.*

Drain compressor oil while compressor is still warm.

Route compressor oil drain hose through hole in base. Remove compressor oil fill cap. Remove cap from oil drain hose and drain oil into a suitable container. Reinstall oil drain hose cap. Tighten cap with wrench.

Remove filter by turning filter counterclockwise. Remove filter. Apply thin coat of oil to gasket on new filter. Install new filter and turn clockwise until tight.

Add recommended oil until oil level indicator shows system is full (see compressor maintenance label for oil specifications). Reinstall oil fill cap. Tighten cap with wrench.

To replace secondary air/oil separator:

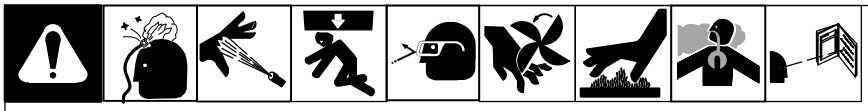
Loosen nut securing tube on separator base. Lift oil scavenge tube from separator. Turn filter counterclockwise. Remove filter.

Apply thin coat of oil to gasket on new filter. Install filter and turn clockwise. Reinstall oil scavenge tube.

Start engine, run air compressor, and check for oil leaks.

Stop engine.

10-6. Adjusting Compressor Air Pressure



Tools Needed:

5/16, 3/8 in.

Check compressor air pressure using air pressure gauge known to be accurate. If necessary, adjust air pressure as follows:

1 Screw

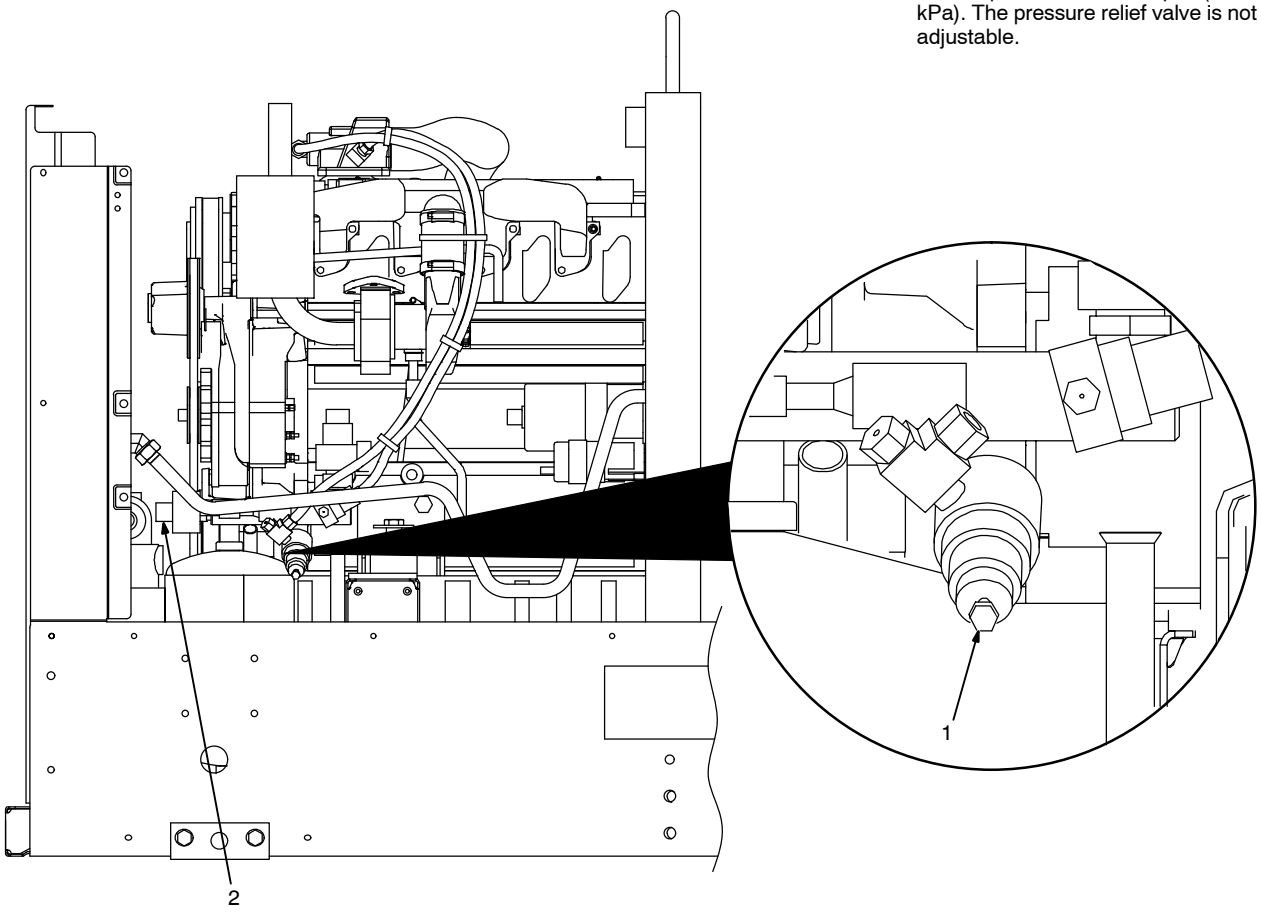
Loosen jam nut securing screw. Turn screw clockwise (increase pressure) or counterclockwise (decrease) until pressure is 125 psi (862 kPa).

☞ *Maximum weld output is reduced if compressor air pressure is set above 125 psi (862 kPa).*

Tighten nut.

2 Pressure Relief Valve

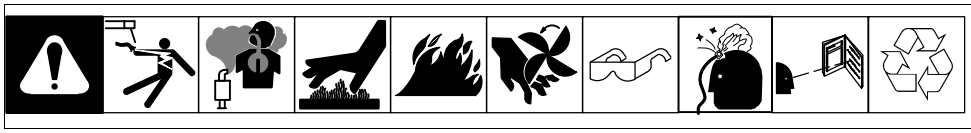
Pressure relief valve opens and releases pressure at 150 psi (1034 kPa). The pressure relief valve is not adjustable.



803 228

SECTION 11 – TROUBLESHOOTING

11-1. Troubleshooting Tables



A. Welding

Trouble	Remedy
No weld output; generator power output okay at AC receptacles.	Place Process/Contactor switch in a Weld Terminals Always On position, or place switch in a Remote On/Off Switch Required position and connect remote contactor to Remote 14 receptacle RC14 (see Sections 5-12 and 6-1).
	Check position of Ampere Range switch.
	Check position of optional Output Selector switch (see Section 8-5).
	Reset supplementary protector CB11 (see Section 9-9).
	Reset supplementary protector CB5 (see Section 9-9). Check for faulty remote device connected to RC14.
	Check and secure connections to Remote 14 receptacle RC14 (see Section 5-12).
	Have Factory Authorized Service Agent check connector board PC6 and connections.
	Check fuse F2, and replace if open (see Section 9-9). Have Factory Authorized Service Agent check brushes and slip rings, field excitation circuit, field current regulator board PC1, and the rotor.
No weld output or generator power output.	Disconnect equipment from generator power receptacles during start-up.
	Check fuses F1 and F2, and replace if open (see Section 9-9). Have Factory Authorized Service Agent check integrated rectifier SR1, capacitor C9, field current regulator board PC1, and the rotor.
	Reset supplementary protector CB12 (see Section 9-9).
	Have Factory Authorized Service Agent check brushes and slip rings, and field excitation circuit.
Erratic weld output.	Check and tighten connections inside and outside unit.
	Be sure connection to work piece is clean and tight.
	Use dry, properly stored electrodes.
	Remove excessive coils from weld cables.
High weld output.	Check position of Ampere Range switch and Voltage/Amperage Adjust control.
	Engine speed may need adjustment. Contact engine manufacturer's Factory Authorized Service Agent.
	Have Factory Authorized Service Agent check field current regulator board PC1.
Voltage/Amperage control does not work when welding in Stick mode.	Place Ampere Range switch in lower range. Voltage/Amperage control does not work with Ampere Range switch in highest range.
Low weld output.	Engine speed may need adjustment. Contact engine manufacturer's Factory Authorized Service Agent.
	Check fuses F1 and F2, and replace if open (see Section 9-9). Have Factory Authorized Service Agent check integrated rectifier SR1, capacitor C9, field current regulator board PC1, and the rotor.
Electrode sticks to the workpiece more frequently during low voltage (short arc length) conditions.	Circuit breaker CB4 may be open. CB4 automatically resets when the fault is corrected (see Section 9-9). Have Factory Authorized Service Agent check transformer T1 and integrated rectifiers SR4 and SR5.
	Have Factory Authorized Service Agent check optional battery charging relay CR7.
Low open-circuit voltage.	Engine speed may need adjustment. Contact engine manufacturer's Factory Authorized Service Agent.
No remote fine amperage or voltage control.	Place Panel/Remote Switch in Remote position.
	Check and secure connections to Remote 14 receptacle RC14 (see Section 5-12).

Trouble	Remedy
	Repair or replace remote control device.
Constant speed wire feeder does not work.	Reset supplementary protector(s) CB5 and CB13 (see Section 9-9).
	Check and secure connections to Remote 14 receptacle RC14 (see Section 5-12).
	Repair or replace wire feeder.
Low CV weld output.	Set Ampere Range switch to highest range.
Min or max CV weld output only.	Check position of Voltage/Amperage Adjust control and Panel/Remote Switch.
	Repair or replace remote control device.
	Have Factory Authorized Service Agent check field current regulator board PC1.

B. Standard Generator Power

Trouble	Remedy
No generator power output at AC receptacles; weld output okay.	Reset receptacle supplementary protectors.
No generator power or weld output.	Disconnect equipment from generator power receptacles during start-up.
	Check fuses F1 and F2, and replace if open (see Section 9-9). Have Factory Authorized Service Agent check integrated rectifier SR1, capacitor C9, diode/capacitor board D1/C1, and the rotor.
	Reset supplementary protector CB12. Have Factory Authorized Service Agent check field current regulator board PC1 (see Section 10-4).
	Have Factory Authorized Service Agent check brushes and slip rings, and field excitation circuit.
High output at generator power receptacles.	Engine speed may need adjustment. Contact engine manufacturer's Factory Authorized Service Agent.
	Have Factory Authorized Service Agent adjust field current resistor R3.
Low output at generator power receptacles.	Engine speed may need adjustment. Contact engine manufacturer's Factory Authorized Service Agent.
	Check fuse F1, and replace if open (see Section 9-9). Have Factory Authorized Service Agent check integrated rectifier SR1, resistor R3, and capacitor C9.

C. Optional AC Power Plant

Trouble	Remedy
No or low output at optional AC power plant/receptacle RC5.	Place Process/Contactor switch in Weld Terminals Always On - Stick position (see Section 6-3).
	Reset supplementary protector CB7 (see Section 7-2).
	Reset supplementary protector CB5 (see Section 9-9).
	Engine speed may need adjustment. Contact engine manufacturer's Factory Authorized Service Agent.
	Have Factory Authorized Service Agent check brushes and slip rings, and field current regulator board PC1.
High output at optional AC power plant/receptacle RC5.	Engine speed may need adjustment. Contact engine manufacturer's Factory Authorized Service Agent.
	Have Factory Authorized Service Agent check field current regulator board PC1.
Erratic output at optional AC power plant/receptacle RC5.	Have Factory Authorized Service Agent check brushes and slip rings, and field current regulator board PC1.

D. Engine

Trouble	Remedy
Engine will not crank.	Check battery, and replace if necessary.
	Check battery connections and tighten if necessary.
	Circuit breaker CB10 may be open. CB10 automatically resets when fault is corrected (see Section 9-9). Have Factory Authorized Service Agent check engine wiring harness and components.
	Check engine wiring harness plug connections.
	Turn optional battery disconnect switch to On position (see Section 5-7).
	Have Factory Authorized Service Agent check Engine Control switch S1, control relay CR1, and diode/ capacitor board D8/C8.
Engine cranks but does not start.	Check fuel level. Optional low fuel shutdown stops engine if fuel level is low.
	Reset supplementary protector CB13 (see Section 10-4). Have Factory Authorized Service Agent check engine wiring harness and components.
	Check battery and replace if necessary. Check engine charging system according to engine manual.
	Have Factory Authorized Service Agent check fuel/hour gauge, control relay CR5, fuel pump, and fuel solenoid FS1.
	Air in fuel system. See engine manual.
Engine starts, but stops when Engine Control switch is released.	Check oil level. Automatic shutdown system stops engine if oil pressure is too low or engine temperature is too high (see Section 5-8).
	Have Factory Authorized Service Agent check fuel/hour gauge, and control relay CR5.
Engine hard to start in cold weather.	Use starting aid switch (see Section 6-1). If Starting Aid switch does not work have Factory Authorized Service Agent check Engine Control switch S2, control relay CR8, and circuit breaker CB16.
	Keep battery in good condition. Store battery in warm area off cold surface.
	Use fuel formulated for cold weather (diesel fuel can gel in cold weather). Contact local fuel supplier for fuel information.
	Use correct grade oil for cold weather (see Section 9-1).
Engine suddenly stops.	Check fuel level. Optional low fuel shutdown stops engine if fuel level is low.
	Check oil level. Automatic shutdown system stops engine if oil pressure is too low or engine temperature is too high (see Section 5-8).
	Have Factory Authorized Service Agent check fuel/hour gauge, control relay CR5, fuel pump, and fuel solenoid FS1.
	See engine manual.
Engine slowly stopped and cannot be restarted.	Check fuel level.
	Check engine air and fuel filters (see Sections 9-5 and 9-8).
	See engine manual.
Battery discharges between uses.	Turn Engine Control switch S1 off when unit is not running.
	Clean top of battery with baking soda and water solution; rinse with clear water.
	Recharge or replace battery if necessary.
	Periodically recharge battery (approximately every 3 months).
Engine idles, but does not come up to weld speed.	Have Factory Authorized Service Agent check idle module PC7.

Trouble	Remedy
Engine does not run at idle speed.	Turn Process/Contactor switch to any position but Remote On/Off Switch Required-TIG.
	Have Factory Authorized Service Agent check idle module PC7, control relays CR3 and CR6, and current transformer CT1.
Engine uses oil during run-in period; wetstacking occurs.	Dry engine (see Section 14).

E. Air Compressor

Trouble	Remedy
Air compressor does not operate; no air pressure at air shutoff valve.	Place Air Compressor switch in On position. The air compressor will not start if still under pressure. If compressor is turned off, wait for air pressure to bleed off (about 20 seconds) before turning compressor on again.
	Reset supplementary protector CB15 (see Section 10-4).
	Check compressor belt tension. Be sure correct belt is used and is properly installed.
	Verify secondary air/oil filter is not plugged. Replace air/oil separator.
	Have Factory Authorized Service Agent check Air Compressor switch S10, control relay CR10, air pressure switch S11, temperature switch S12, compressor control circuit, and air compressor clutch.
Air compressor stops after short period of operation.	Check compressor oil level (see Section 5-8). Automatic shutdown stops compressor if compressor temperature is too high.
	Clean debris from radiator. Automatic shutdown stops compressor if compressor temperature is too high.
Low air pressure.	Check for leaks in air lines and hoses.
	Adjust compressor air pressure (see Section 10-6).
	Check air compressor air cleaner (see Section 10-3).
	Have Factory Authorized Service Agent check compressor for rated output.
High air pressure.	Adjust compressor air pressure (see Section 10-6).
	Be sure control line is connected at regulator valve and inlet valve.
Pneumatic tools freeze up because of moisture in compressed air.	Install optional air dryer/filter kit (Part No. 195 117).
Oil in air from compressor.	Check compressor oil level (see Section 5-8). If oil level is too high, system becomes saturated with oil.
	Change compressor air/oil separator (see Section 10-5).
	Check connections of control lines (see air compressor circuit diagram in Section 12).
	Have Factory Authorized Service Agent check for blocked separator scavenge check valve/filter orifice.
Oil in compressor air cleaner.	Have Factory Authorized Service Agent verify compressor inlet valve is operating properly.

F. Optional Battery Charging

Trouble	Remedy
No battery charge output; weld output okay.	Place Output Selector switch in 12 Volt Charge or 24 Volt Charge position.
	Check and tighten battery connections if necessary.
	Turn on remote control device or turn Process/Contactor switch to any Weld Terminals Always On position (see Section 6-3).
No battery charge or weld output.	Disconnect equipment from generator power receptacles during start-up.
	Check fuses F1 and F2, and replace if open (see Section 9-9). Have Factory Authorized Service Agent check integrated rectifier SR1, capacitor C9, field current regulator board PC1, and the rotor.
	Reset supplementary protector CB12 (see Section 9-9).
	Have Factory Authorized Service Agent check brushes and slip rings, field current regulator board PC1, and field excitation circuit.

SECTION 12 – CIRCUIT DIAGRAM

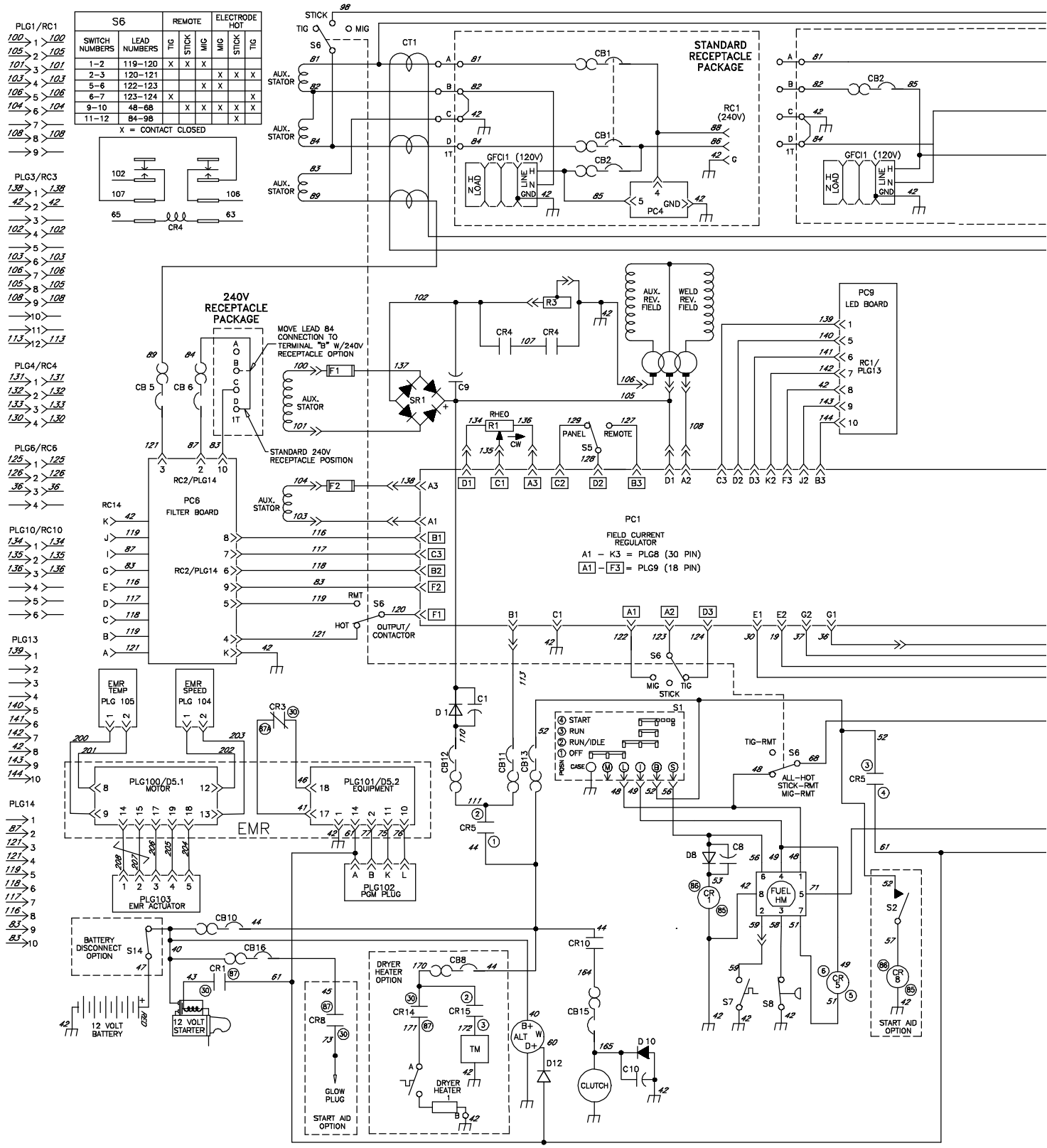
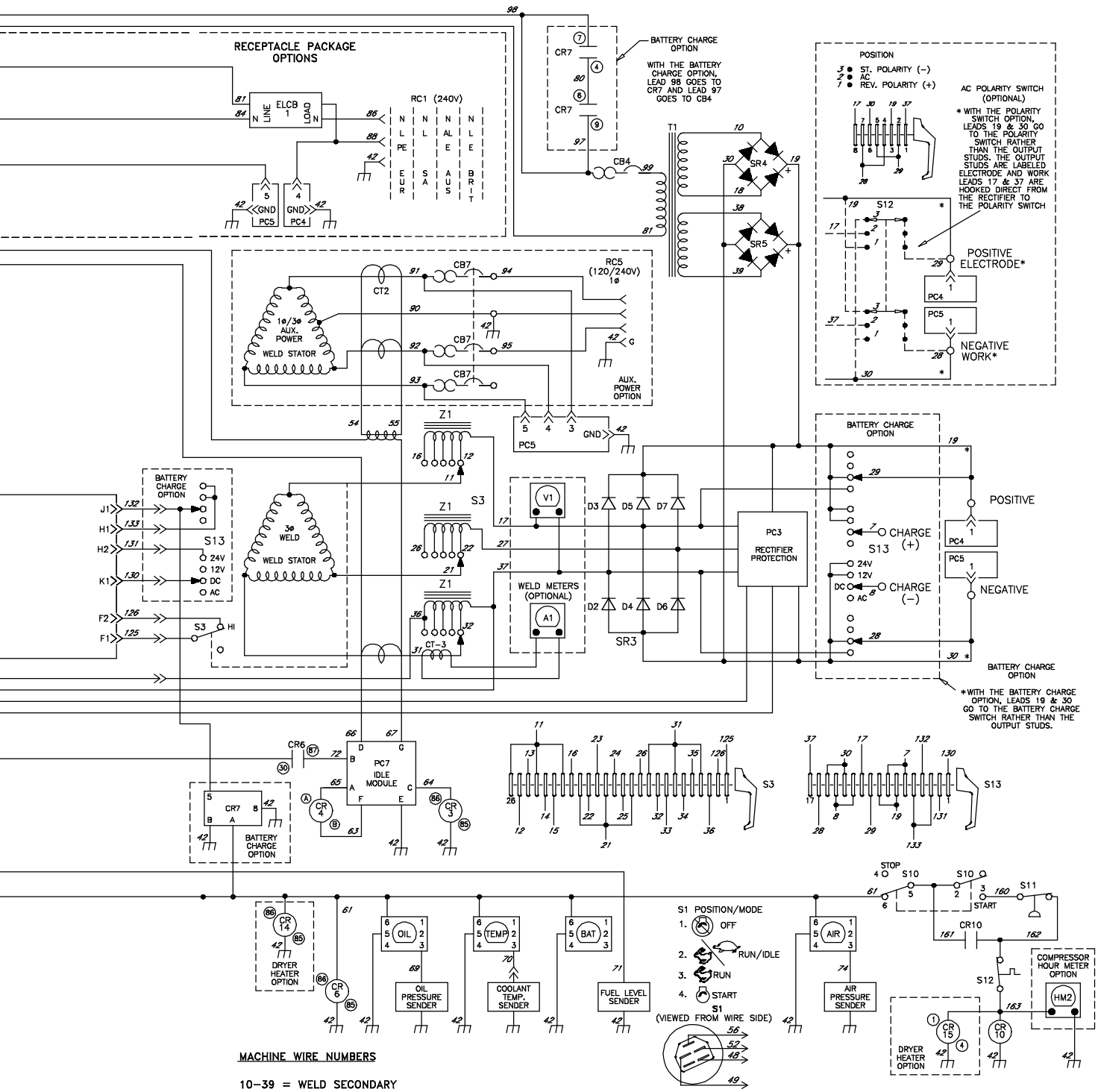


Figure 12-1. Circuit Diagram For Welding Generator



⚠ WARNING	• Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed. • Have only qualified persons install, use, or service this unit.
ELECTRIC SHOCK HAZARD	

242 624-B

SECTION 13 – AIR COMPRESSOR DIAGRAM

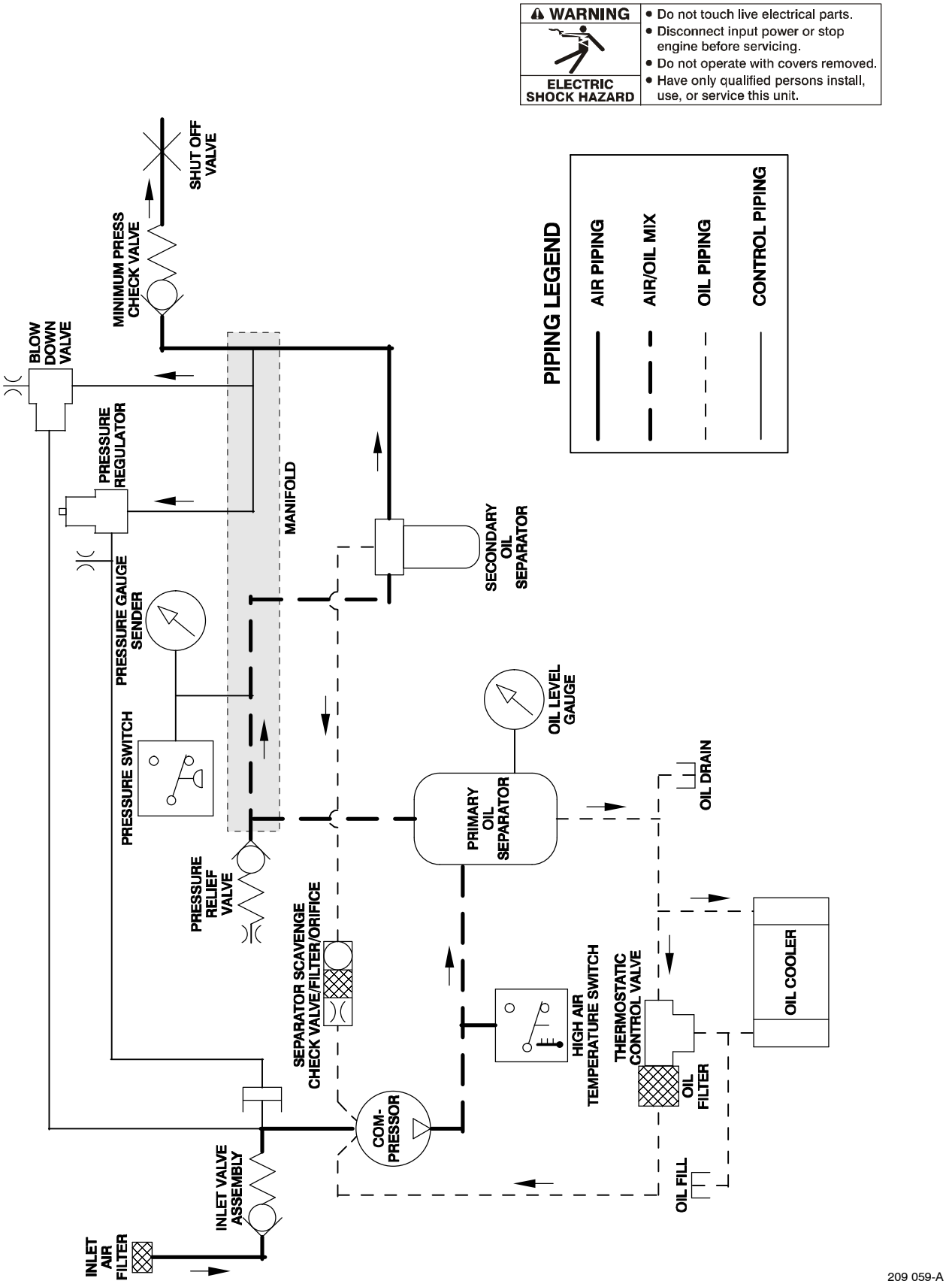
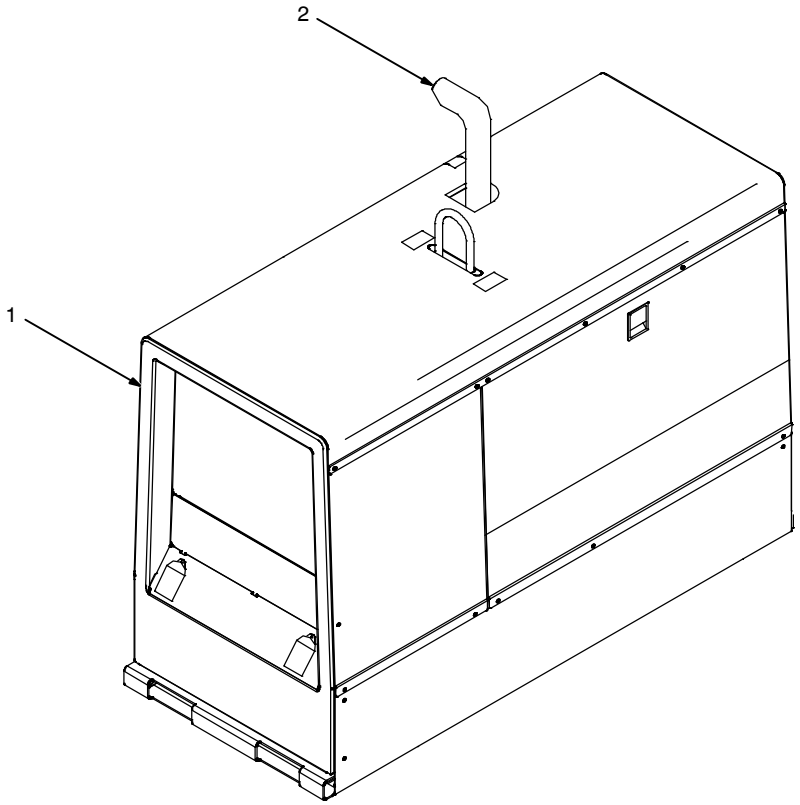


Figure 13-1. Circuit Diagram For Air Compressor

SECTION 14 – RUN-IN PROCEDURE

14-1. Wetstacking



NOTICE *– Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.*

1 Welding Generator

Run diesel engines near rated voltage and current during run-in period to properly seat piston rings and prevent wetstacking. See nameplate, rating label, or specifications section in this manual to find rated voltage and current.

NOTICE *– Do not idle engine longer than necessary. Piston rings seat faster if engine runs at weld/power rpm, and the welding generator is kept loaded during run-in.*

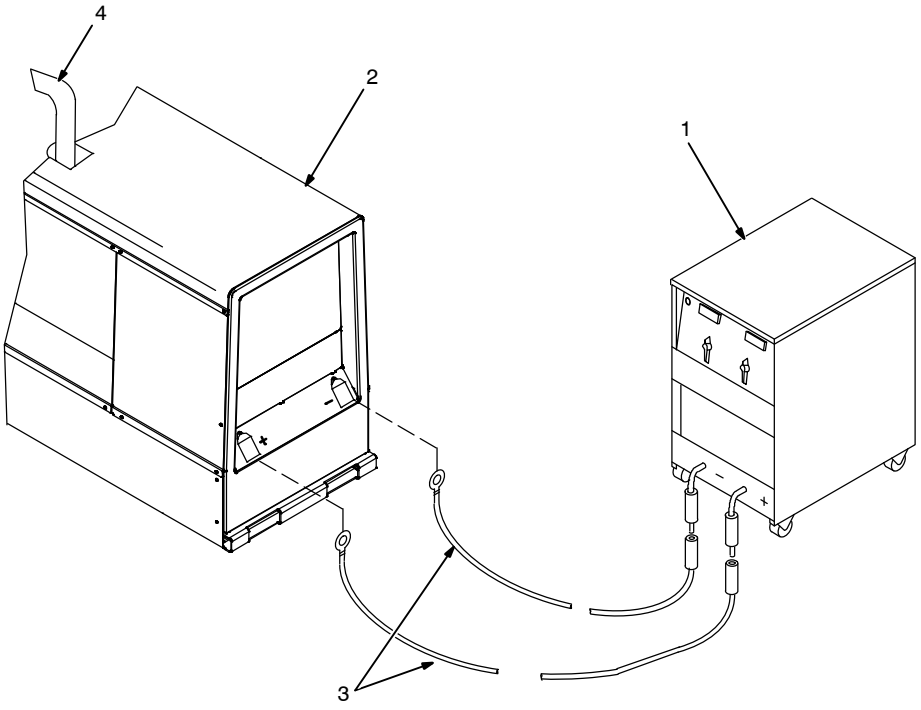
2 Engine Exhaust Pipe

Wetstacking is unburned fuel and oil in the exhaust pipe and occurs during run-in if the engine is run too long at light load or idle rpm.

If exhaust pipe is coated with a wet, black, tar-like substance, dry the engine using one of the following run-in procedures.

See the engine manual for additional engine run-in information.

14-2. Run-In Procedure Using Load Bank



Stop engine.

Do not touch hot exhaust pipe, engine parts, or load bank/grid.

Keep exhaust and pipe away from flammables.

NOTICE *– Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.*

1 Load Bank

Turn all load bank switches Off. If needed, connect load bank to 115 volts ac wall receptacle or generator auxiliary power receptacle.

2 Welding Generator

Place A/V range switch in maximum position, A/V control in minimum position, and Output Selector switch (if present) in either DC position.

3 Weld Cables

Connect load bank to generator weld output terminals using proper size weld cables with correct connectors. Observe correct polarity.

Start engine and run for several minutes.

Set load bank switches and then adjust generator A/V control so load equals rated voltage and current of generator (see nameplate, rating label, or the specifications section in this manual).

Check generator and load bank meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

NOTICE *– Check oil level frequently during run-in; add oil if needed.*

It is recommended to run the welding generator for two hours minimum and up to four hours under load. Place A/V control in minimum position, then turn off load bank to remove load. Run engine several minutes at no load.

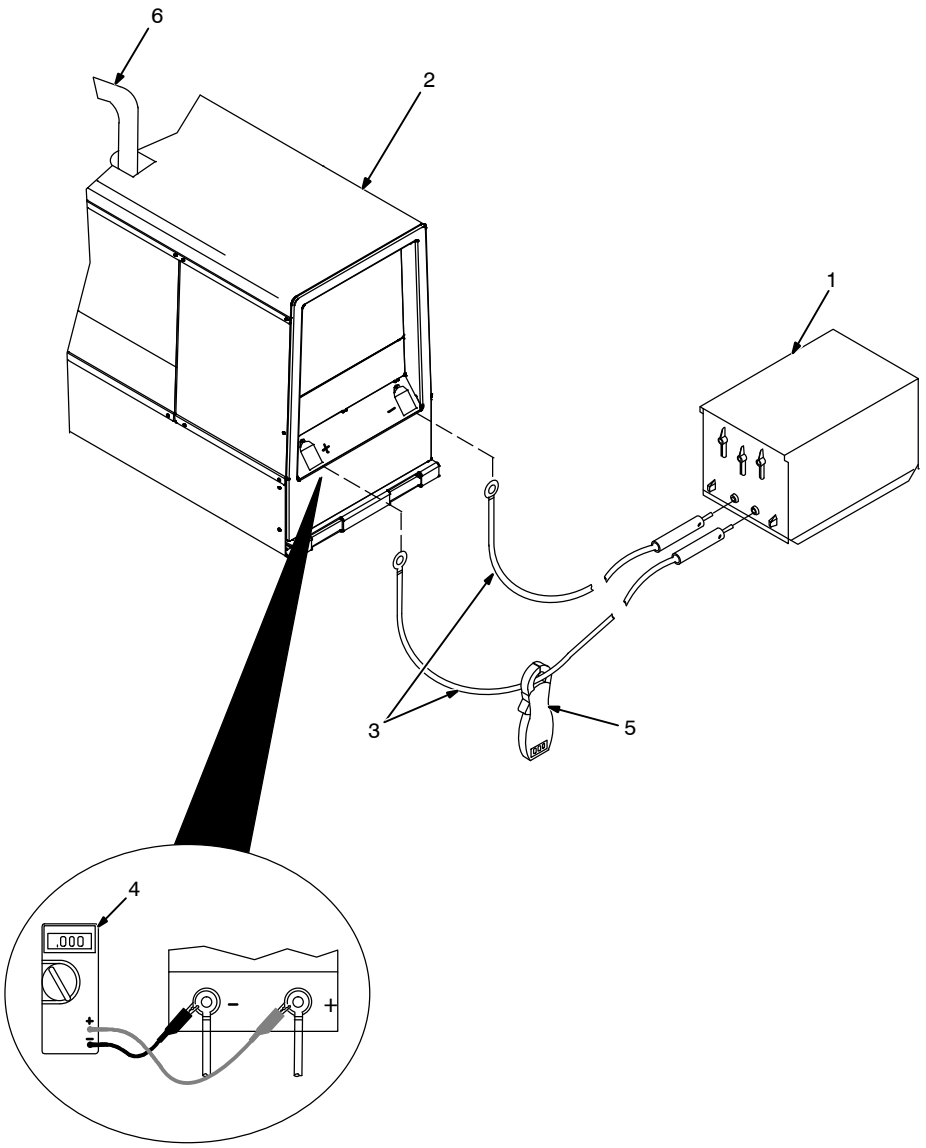
Stop engine and let cool.

4 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

S-0683

14-3. Run-In Procedure Using Resistance Grid



⚠ **Stop engine.**

⚠ **Do not touch hot exhaust pipe, engine parts, or load bank/grid.**

⚠ **Keep exhaust and pipe away from flammables.**

NOTICE *– Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.*

1 Resistance Grid

Use grid sized for generator rated output.

Turn Off grid.

2 Welding Generator

Place A/V range switch in maximum position, A/V control in minimum position, and Output Selector switch (if present) in either DC position.

3 Weld Cables

Connect grid to generator weld output terminals using proper size weld cables with correct connectors (polarity is not important).

4 Voltmeter

5 Clamp-On Ammeter

Connect voltmeter and ammeter as shown, if not provided on generator.

Start engine and run for several minutes.

Set grid switches and then adjust generator A/V control so load equals rated voltage and current of the generator (see nameplate, rating label, or the specifications section in this manual).

Check generator and meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

NOTICE *– Check oil level frequently during run-in; add oil if needed.*

It is recommended to run the welding generator for two hours minimum and up to four hours under load. Place A/V control in minimum position, then shut down grid to remove load. Run engine several minutes at no load.

⚠ **Stop engine and let cool.**

6 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

S-0684

SECTION 15 – AIR COMPRESSOR TABLES

15-1. Flow Of Free Air (CFM) Through Orifices Of Various Diameters

Gauge Pressure (psi)	Orifice Diameter (in) And Free Air Flow (CFM)							
	1/64	1/32	3/64	1/16	3/32	1/8	3/16	1/4
1	0.027	0.107	0.242	0.430	0.97	1.72	3.86	6.85
2	0.038	0.153	0.342	0.607	1.36	2.43	5.42	9.74
3	0.046	0.188	0.471	0.750	1.68	2.98	6.71	11.9
5	0.059	0.242	0.545	0.965	2.18	3.86	8.71	15.4
10	0.084	0.342	0.77	1.36	3.08	5.45	12.3	21.8
15	0.103	0.418	0.94	1.67	3.75	6.65	15.0	26.7
20	0.119	0.485	1.07	1.93	4.25	7.7	17.1	30.8
25	0.133	0.54	1.21	2.16	4.75	8.6	19.4	34.5
30	0.156	0.632	1.40	2.52	5.6	10.0	22.5	40.0
35	0.173	0.71	1.56	2.80	6.2	11.2	25.0	44.7
40	0.19	0.77	1.71	3.07	6.8	12.3	27.3	49.1
45	0.208	0.843	1.9	3.36	7.6	13.4	30.3	53.8
50	0.225	9.14	2.05	3.64	8.2	14.5	32.8	58.2
60	0.26	1.05	2.35	4.2	9.4	16.8	37.5	67.0
70	0.295	1.19	2.68	4.76	10.7	19.0	43.0	76.0
80	0.33	1.33	2.97	5.32	11.9	21.2	47.5	85.0
90	0.364	1.47	3.28	5.87	13.1	23.5	52.5	94.0
100	0.40	1.61	3.66	6.45	14.5	25.8	58.3	103.0
110	0.43	1.76	3.95	7.00	15.7	28.0	63.0	112.0
120	0.47	1.90	4.27	7.58	17.0	30.2	68.0	121.0
130	0.50	2.04	4.57	8.13	18.2	32.4	73.0	130.0
140	0.54	2.17	4.87	8.68	19.5	34.5	78.0	138.0
150	0.57	2.33	5.2	9.20	20.7	36.7	83.0	147.0
175	0.66	2.65	5.94	10.6	23.8	42.1	95.0	169.0
200	0.76	3.07	6.90	12.2	27.5	48.7	110.0	195.0

15-2. Approximate Air Consumption (Cubic Feet) To Operate Pneumatic Equipment At 70-90 P.S.I.G.

MISCELLANEOUS PORTABLE TOOLS	Percent Use Factor And Compressed Air Consumption (CF)				MISCELLANEOUS PORTABLE TOOLS	Percent Use Factor And Compressed Air Consumption (CF)			
	9 sec	15 sec	21 sec	1 min		9 sec	15 sec	21 sec	1 min
Drill, 1/18" to 3/8"	3.75	6.25	8.75	25	Burring Tool, Large	3.6	6.0	8.4	24
Drill, 3/8" to 5/16"	5.25	8.75	12.25	35	Rammers, Small	3.9	3.25	9.1	13
Screwdriver, #2 to #6 Screw	1.8	3.0	4.2	12	Rammers, Medium	5.1	8.5	11.9	34
Screwdriver, #6 to 5/16" Screw	3.6	6.0	8.4	24	Rammers, Large	6.0	10.0	14.0	40
Tapper, to 3/8"	3.0	5.0	7.0	20	Backfill Tamper	3.75	6.25	8.75	25
Nutsetters, to 3/8"	3.6	6.0	8.4	24	Compression Riveter	0.2 cu. ft. per cycle			
Nutsetters, to 3/4"	4.5	7.5	10.5	30	Air Motor, 1 Horsepower	3.75	6.3	8.75	25
Impact Wrench, 1/4"	2.25	3.75	5.3	15	Air Motor, 2 Horsepower	7.5	12.5	17.5	50
Impact Wrench, 3/8"	3.0	5.0	7.0	20	Air Motor, 3 Horsepower	11.25	18.75	26.3	75
Impact Wrench, 5/8"	4.5	7.5	10.5	30					
Impact Wrench, 3/4"	5.25	8.75	12.25	35	Paint Spray Gun (Production)	3.0	5.00	7.00	20
Impact Wrench, 1"	6.75	11.25	15.75	45	,HAMMERS				
Impact Wrench, 1-1/4"	8.25	13.75	19.2	55	Scaling Hammer	1.3	3.0	4.2	12
Die Grinder, Small	2.25	3.75	5.3	15	Chipping Hammer	4.5	7.5	10.5	30
Die Grinder, Medium	3.6	6.0	8.4	24					
Horizontal Grinder, 2"	3.0	5.0	7.0	20	Riveting Hammer, Light	2.25	3.75	5.25	15
Horizontal Grinder, 4"	9.0	15.0	21.0	60	Riveting Hammer, Heavy	4.5	7.5	10.5	30
Horizontal Grinder, 6"	9.0	15.0	21.0	60	SAWS				
Horizontal Grinder, 8"	12.0	20.0	28.0	80	Circular, 8"	6.75	11.25	15.75	45
					Circular, 12"	9.75	16.25	23.8	65
Vertical Grinders and Sanders, 5" Pad	5.25	8.75	12.25	35	Chain, Lightweight	4.20	7.0	9.8	28
Vertical Grinders and Sanders, 7" Pad	9.0	15.0	21.0	60	Chain, Heavy Duty	13.1	21.8	30.5	87
Vertical Grinders and Sanders, 9" Pad	10.5	17.5	24.5	70					
Burring Toll, Small	2.25	3.75	5.3	15					

Always check with tool manufacturers for actual air consumption of tools being used. The above is based on averages and should not be considered accurate for any particular make of tool.

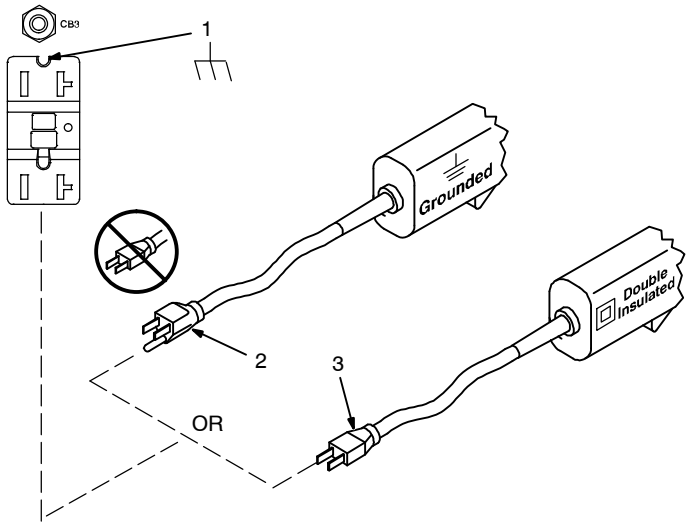
Above tools are rated based upon typical "on-load" performance characteristics.

For other values, adjust the C.F. air consumption on a proportional basis.
The cubic feet (C.F.) air consumption for 1 minute may also be expressed as air consumption in cubic feet per minute (C.F.M.)

SECTION 16 – GENERATOR POWER GUIDELINES

☞ *The views in this section are intended to be representative of all engine-driven welding generators. Your unit may differ from those shown.*

16-1. Selecting Equipment



1 Generator Power Receptacles – Neutral Bonded To Frame

2 3-Prong Plug From Case Grounded Equipment

3 2-Prong Plug From Double Insulated Equipment

☞ *Be sure equipment has double insulated symbol and/or wording on it.*

⚠ **Do not use 2-prong plug unless equipment is double insulated.**

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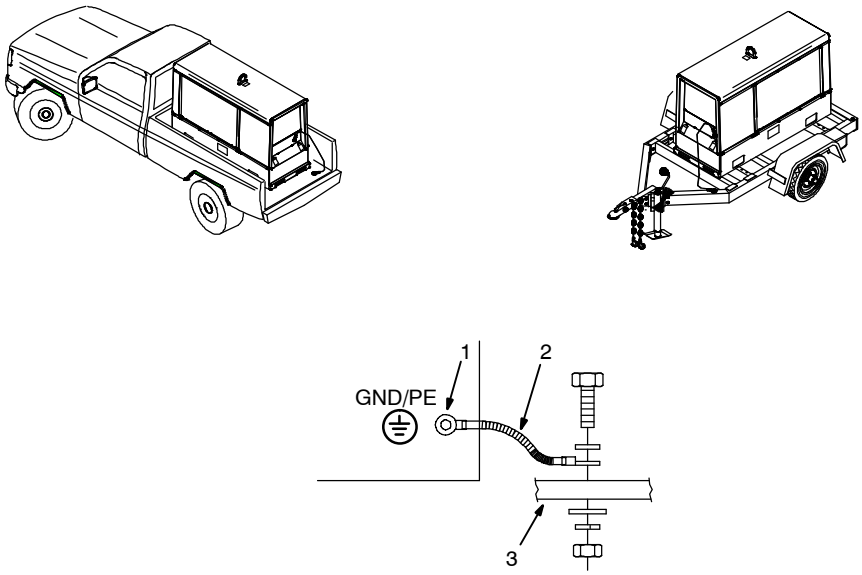
16-2. Grounding Generator To Truck Or Trailer Frame



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⚠ **Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.**

⚠ **Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.**

1 Equipment Grounding Terminal (On Front Panel)

2 Grounding Cable (Not Supplied)

3 Metal Vehicle Frame

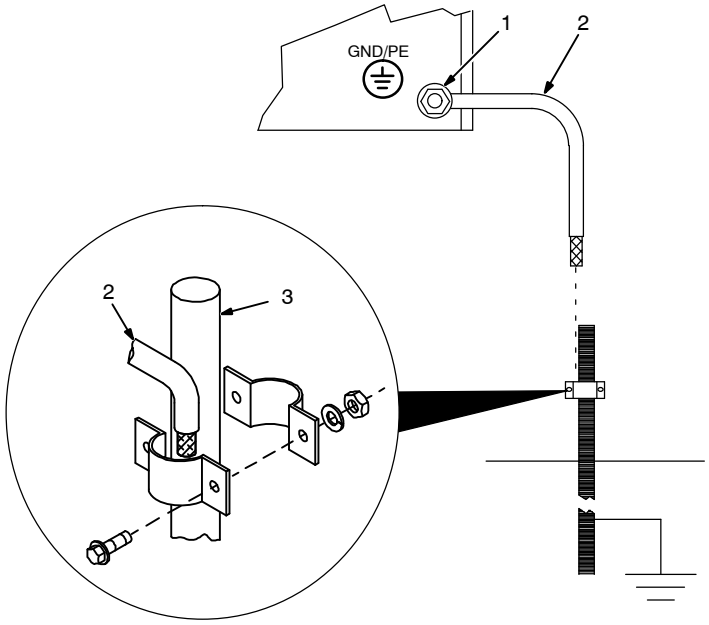
Connect cable from equipment ground terminal to metal vehicle frame. Use #8 AWG or larger insulated copper wire.

☞ *Electrically bond generator frame to vehicle frame by metal-to-metal contact.*

⚠ **Bed liners, shipping skids, and some running gear insulate the welding generator from the vehicle frame. Always connect a ground wire from the generator equipment grounding terminal to bare metal on the vehicle frame as shown.**

⚠ **Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment..**

16-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

Use #8 AWG or larger insulated copper wire.

3 Ground Device

☞ *Use ground device as stated in electrical codes.*

Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.

Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.

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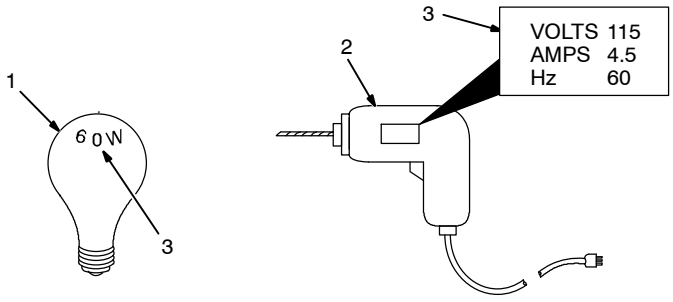
16-4. How Much Power Does Equipment Require?



1 Resistive Load

A light bulb is a resistive load and requires a constant amount of power.

2 Non-Resistive Load

Equipment with a motor is a non-resistive load and requires approximately six times more power while starting the motor than when running (see Section 16-8).

3 Rating Data

Rating shows volts and amperes, or watts required to run equipment.

Amperes x Volts = Watts

Example 1: If a drill uses 4.5 amperes at 115 volts, calculate its running power requirement in watts.

4.5 A x 115 V = 520 W

The load applied by the drill is 520 watts.

Example 2: If three 200 watt flood lamps are used with the drill from Example 1, add the individual loads to calculate total load.

(3 x 200W) + 520 W = 1120 W

The total load applied by the three flood lamps and drill is 1120 watts.

S-0623

16-5. Approximate Power Requirements For Industrial Motors

Industrial Motors	Rating	Starting Watts	Running Watts
Split Phase	1/8 HP	800	300
	1/6 HP	1225	500
	1/4 HP	1600	600
	1/3 HP	2100	700
	1/2 HP	3175	875
Capacitor Start-Induction Run	1/3 HP	2020	720
	1/2 HP	3075	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

16-6. Approximate Power Requirements For Farm/Home Equipment

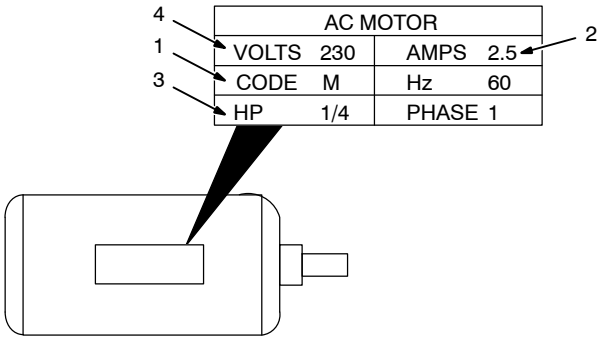
Farm/Home Equipment	Rating	Starting Watts	Running Watts
Stock Tank De-Icer		1000	1000
Grain Cleaner	1/4 HP	1650	650
Portable Conveyor	1/2 HP	3400	1000
Grain Elevator	3/4 HP	4400	1400
Milk Cooler		2900	1100
Milker (Vacuum Pump)	2 HP	10500	2800
FARM DUTY MOTORS	1/3 HP	1720	720
Std. (e.g. Conveyors,	1/2 HP	2575	975
Feed Augers, Air	3/4 HP	4500	1400
Compressors)	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
High Torque (e.g. Barn	1-1/2 HP	8100	2000
Cleaners, Silo Unloaders,	5 HP	23300	6000
Silo Hoists, Bunk Feeders)	7-1/2 HP	35000	8000
	10 HP	46700	10700
3-1/2 cu. ft. Mixer	1/2 HP	3300	1000
High Pressure 1.8 Gal/Min	500 PSI	3150	950
Washer 2 gal/min	550 PSI	4500	1400
2 gal/min	700 PSI	6100	1600
Refrigerator or Freezer		3100	800
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000
Sump Pump	1/3 HP	2100	800
	1/2 HP	3200	1050

16-7. Approximate Power Requirements For Contractor Equipment

Contractor	Rating	Starting Watts	Running Watts
Hand Drill	1/4 in	350	350
	3/8 in	400	400
	1/2 in	600	600
Circular Saw	6-1/2 in	500	500
	7-1/4 in	900	900
	8-1/4 in	1400	1400
Table Saw	9 in	4500	1500
	10 in	6300	1800
Band Saw	14 in	2500	1100
Bench Grinder	6 in	1720	720
	8 in	3900	1400
	10 in	5200	1600
Air Compressor	1/2 HP	3000	1000
	1 HP	6000	1500
	1-1/2 HP	8200	2200
	2 HP	10500	2800
Electric Chain Saw	1-1/2 HP, 12 in	1100	1100
	2 HP, 14 in	1100	1100
Electric Trimmer	Standard 9 in	350	350
	Heavy Duty 12 in	500	500
Electric Cultivator	1/3 HP	2100	700
Elec. Hedge Trimmer	18 in	400	400
Flood Lights	HID	125	100
	Metal Halide	313	250
	Mercury	1000	
	Sodium	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

16-8. Power Required To Start Motor

Single-Phase Induction Motor Starting Requirements								
Motor Start Code	G	H	J	K	L	M	N	P
KVA/HP	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0



1 Motor Start Code

2 Running Amperage

3 Motor HP

4 Motor Voltage

To find starting amperage:

Step 1: Find code and use table to find kVA/HP. If code is not listed, multiply running amperage by six to find starting amperage.

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

Welding generator amperage output must be at least twice the motor's running amperage.

(kVA/HP x HP x 1000) / Volts = Starting Amperage

Example: Calculate starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

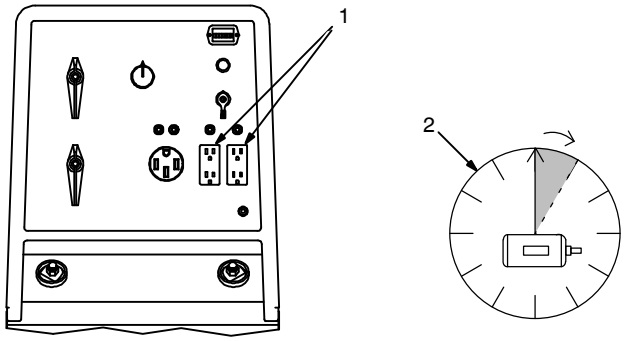
Volts = 230, HP = 1/4, kVA/HP = 11.2

(11.2 x 1/4 x 1000) / 230 = 12.2A

Starting the motor requires 12.2 amperes.

S-0624

16-9. How Much Power Can Generator Supply?



1 Limit Load To 90% Of Generator Output

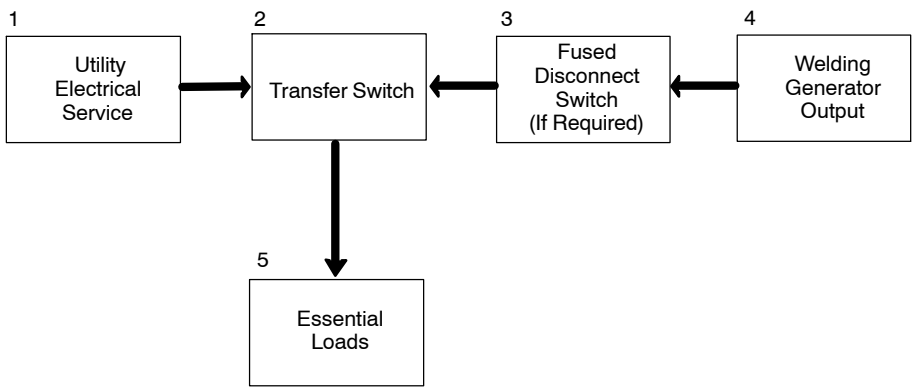
Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

2 5 Second Rule

If motor does not start within 5 seconds, turn off power to prevent motor damage. Motor requires more power than generator can supply.

Ref. ST-800 396-A / S-0625

16-10. Typical Connections To Supply Standby Power



Have only qualified persons perform these connections according to all applicable codes and safety practices.

Properly install, ground, and operate this equipment according to its Owner's Manual and national, state, and local codes.

☞ *Customer-supplied equipment is required if generator will supply standby power during emergencies or power outages.*

1 Utility Electrical Service

2 Transfer Switch (Double-Throw)

Switch transfers the electrical load from electric utility service to the generator. Transfer load back to electric utility when service is restored.

Install correct switch (customer-supplied). Switch rating must be same as or greater than the branch overcurrent protection.

3 Fused Disconnect Switch

Install correct switch (customer-supplied) if required by electrical code.

4 Welding Generator Output

Generator output voltage and wiring must be consistent with regular (utility) system voltage and wiring.

Connect generator with temporary or permanent wiring suitable for the installation.

Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

5 Essential Loads

Generator output may not meet the electrical requirements of the premises. If generator does not produce enough output to meet all requirements, connect only essential loads (pumps, freezers, heaters, etc. – See Section 16-4).

16-11. Selecting Extension Cord (Use Shortest Cord Possible)

Cord Lengths for 120 Volt Loads

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	600			350 (106)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

*Conductor size is based on maximum 2% voltage drop

Cord Lengths for 240 Volt Loads

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10,800	200 (61)	125 (38)				
50	12,000	175 (53)	100 (31)				

*Conductor size is based on maximum 2% voltage drop

SECTION 17 – SELECTING AND PREPARING A TUNGSTEN FOR DC OR AC WELDING

Whenever possible and practical, use DC weld output instead of AC weld output.

17-1. Selecting Tungsten Electrode (Wear Clean Gloves To Prevent Contamination Of Tungsten)

☞ *Not all tungsten electrode manufacturers use the same colors to identify tungsten type. Contact the tungsten electrode manufacturer or reference the product packaging to identify the tungsten you are using.*

Electrode Diameter	Amperage Range - Gas Type♦ - Polarity	
	(DCEN) – Argon Direct Current Electrode Negative (For Use With Mild Or Stainless Steel)	AC – Argon Balance Control @ 65% Electrode Negative (For Use With Aluminum)
2% Ceria, 1.5% Lanthanum, Or 2% Thorium Alloy Tungstens		
.040” (1 mm)	25-85	20-80
1/16” (1.6 mm)	50-160	50-150
3/32” (2.4 mm)	130-250	135-235
1/8” (3.2 mm)	250-400	225-360
Pure Tungsten		
.040” (1 mm)	Pure Tungsten Not Recommended For DCEN – Argon	10-60
1/16” (1.6 mm)		50-100
3/32” (2.4 mm)		100-160
1/8” (3.2 mm)		150-210

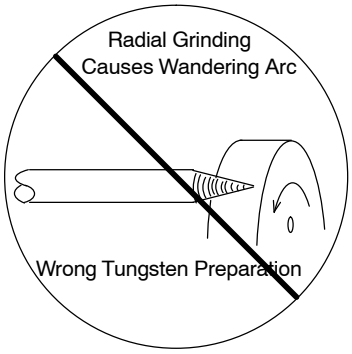
♦Typical argon shielding gas flow rates are 11 to 35 cfh (cubic feet per hour).

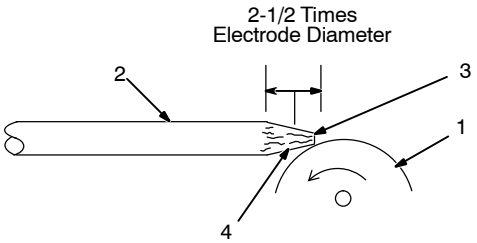
Figures listed are a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

17-2. Preparing Tungsten Electrode For Welding With Phase Control Machines

Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using tungsten containing ceria, lanthana, or yttria instead of thoria. Grinding dust from thoriated electrodes contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

A. Preparing Tungsten For DC Electrode Negative (DCEN) Welding





Ideal Tungsten Preparation – Stable Arc

1 Grinding Wheel

Grind end of tungsten on fine grit, hard abrasive wheel before welding. Do not use wheel for other jobs or tungsten can become contaminated causing lower weld quality.

2 Tungsten Electrode

A 2% ceriated tungsten is recommended.

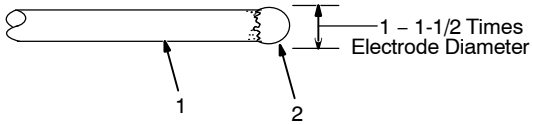
3 Flat

Diameter of this flat determines amperage capacity.

4 Straight Ground

Grind lengthwise, **not radial**.

B. Preparing Tungsten For AC Welding



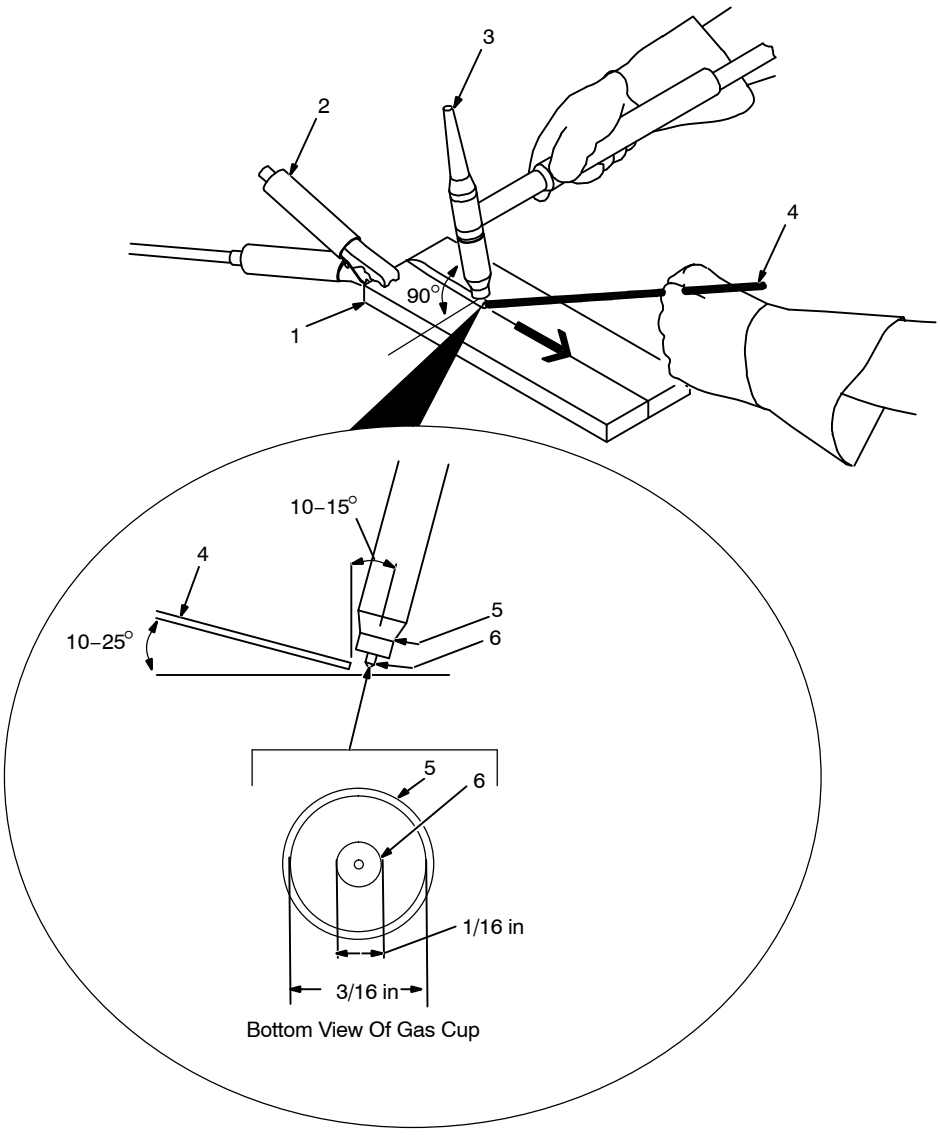
1 Tungsten Electrode

A pure tungsten is recommended..

2 Balled End

Ball end of tungsten by applying AC amperage recommended for a given electrode diameter (see Section 17-1). Let ball on end of the tungsten take its own shape.

18-1. Positioning The Torch



Bottom View Of Gas Cup

Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using cerium or lanthanum based tungsten instead of thoriated. Thorium dust contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

1 Workpiece

Make sure workpiece is clean before welding.

2 Work Clamp

Place as close to the weld as possible.

3 Torch

4 Filler Rod (If Applicable)

5 Gas Cup

6 Tungsten Electrode

Select and prepare tungsten according to Section 17.

Guidelines:

The inside diameter of the gas cup should be at least three times the tungsten diameter to provide adequate shielding gas coverage. (For example, if tungsten is 1/16 in diameter, gas cup should be a minimum of 3/16 in diameter.

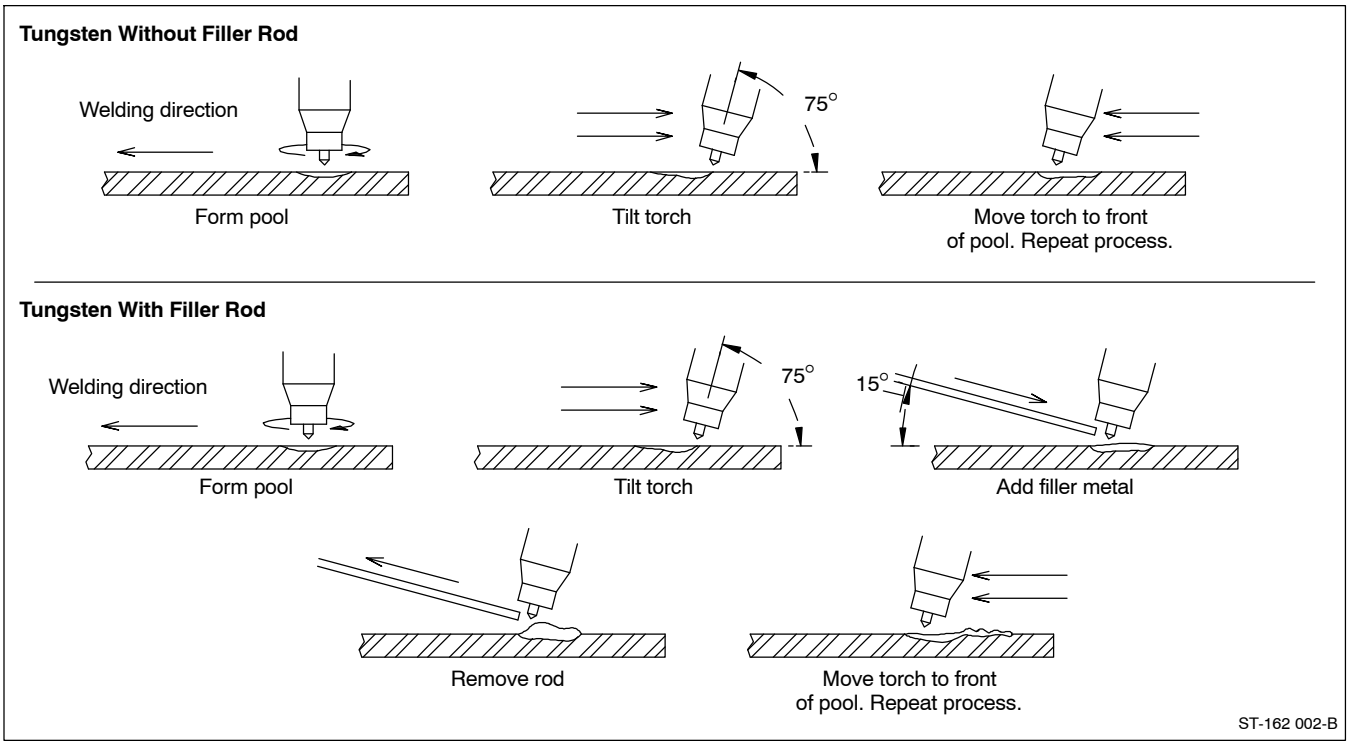
Tungsten extension is the distance the tungsten extends out gas cup of torch.

The tungsten extension should be no greater than the inside diameter of the gas cup.

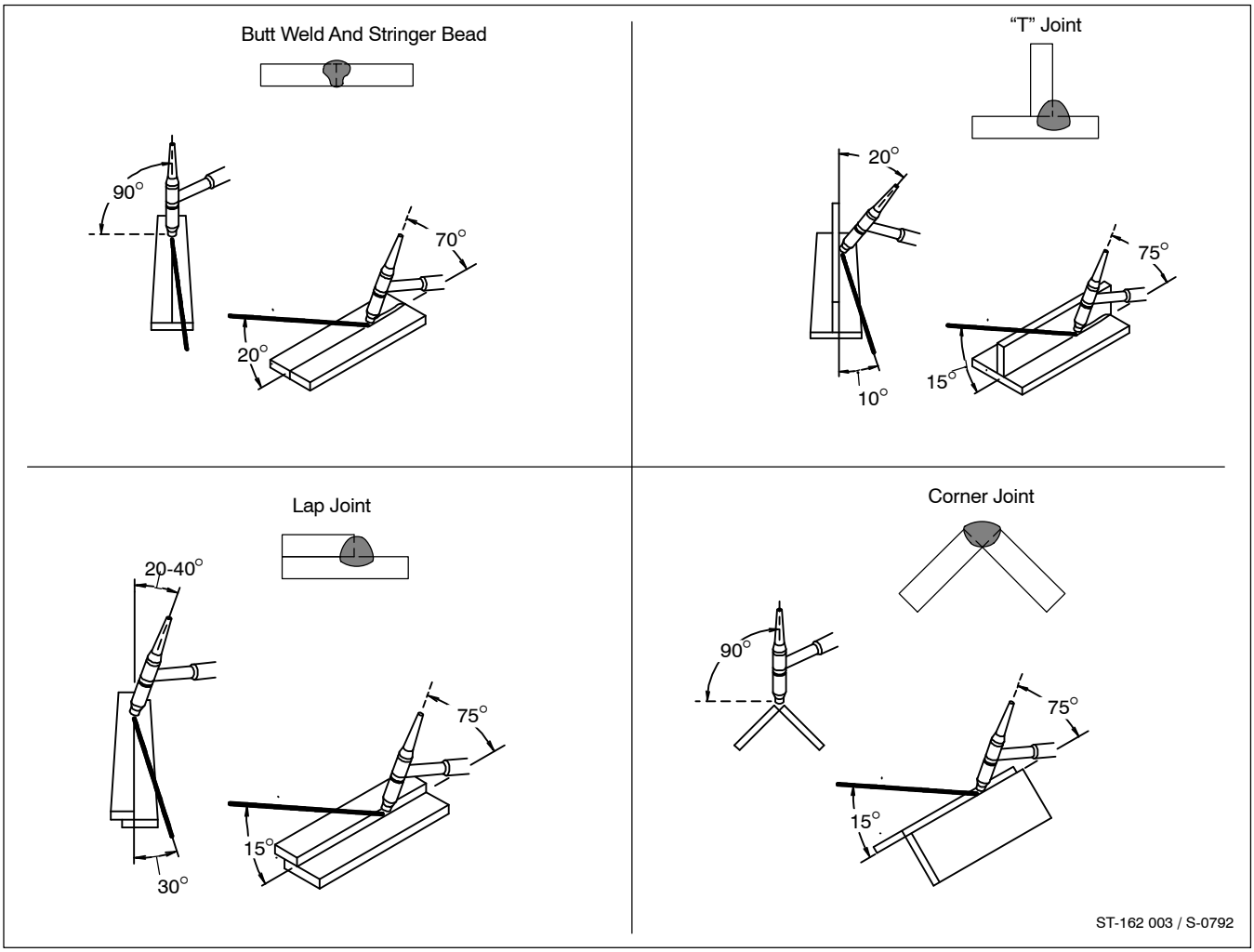
Arc length is the distance from the tungsten to the workpiece.

Ref. ST-161 892

18-2. Torch Movement During Welding



18-3. Positioning Torch Tungsten For Various Weld Joints



☞ *Hardware is common and not available unless listed.*

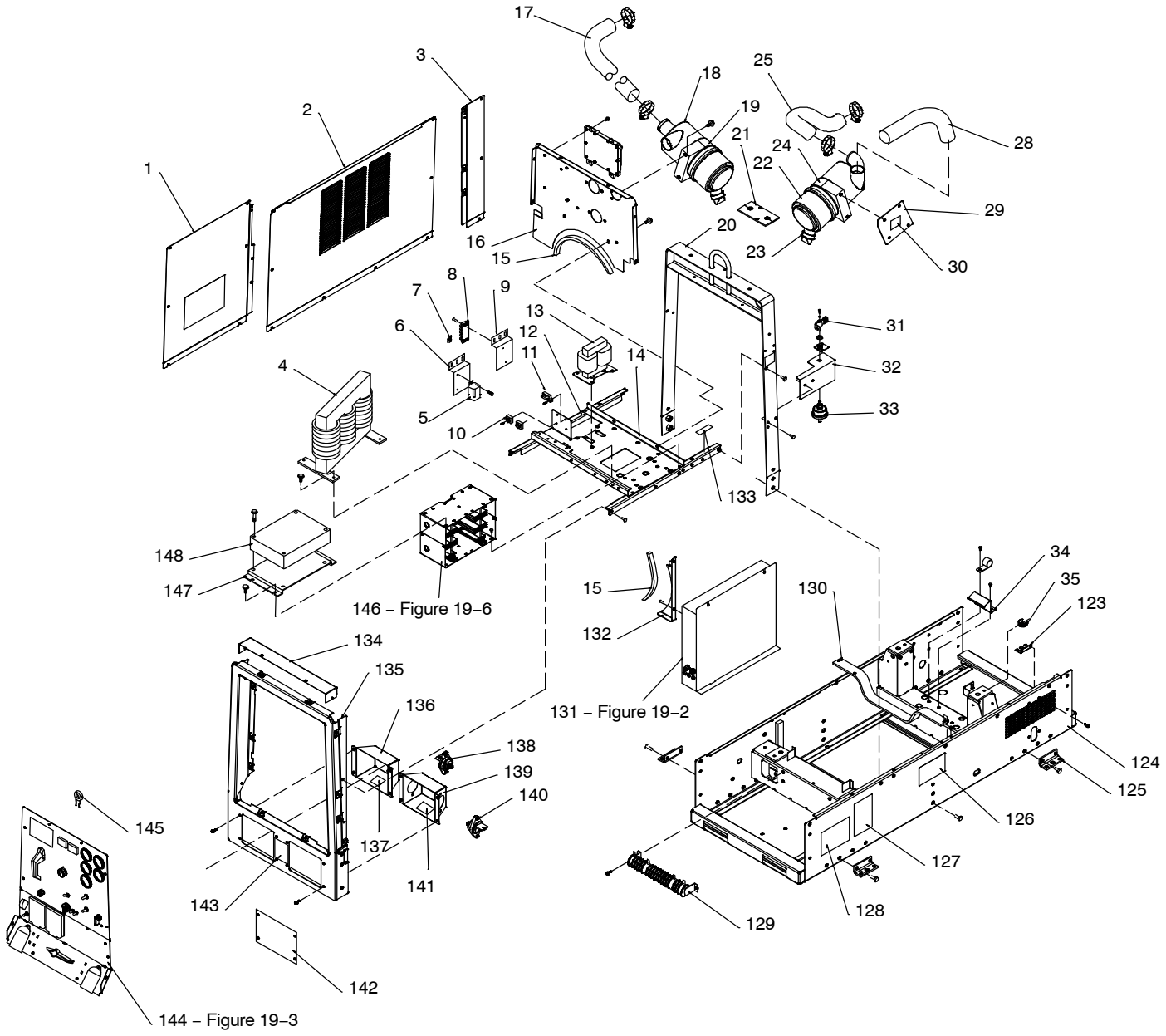
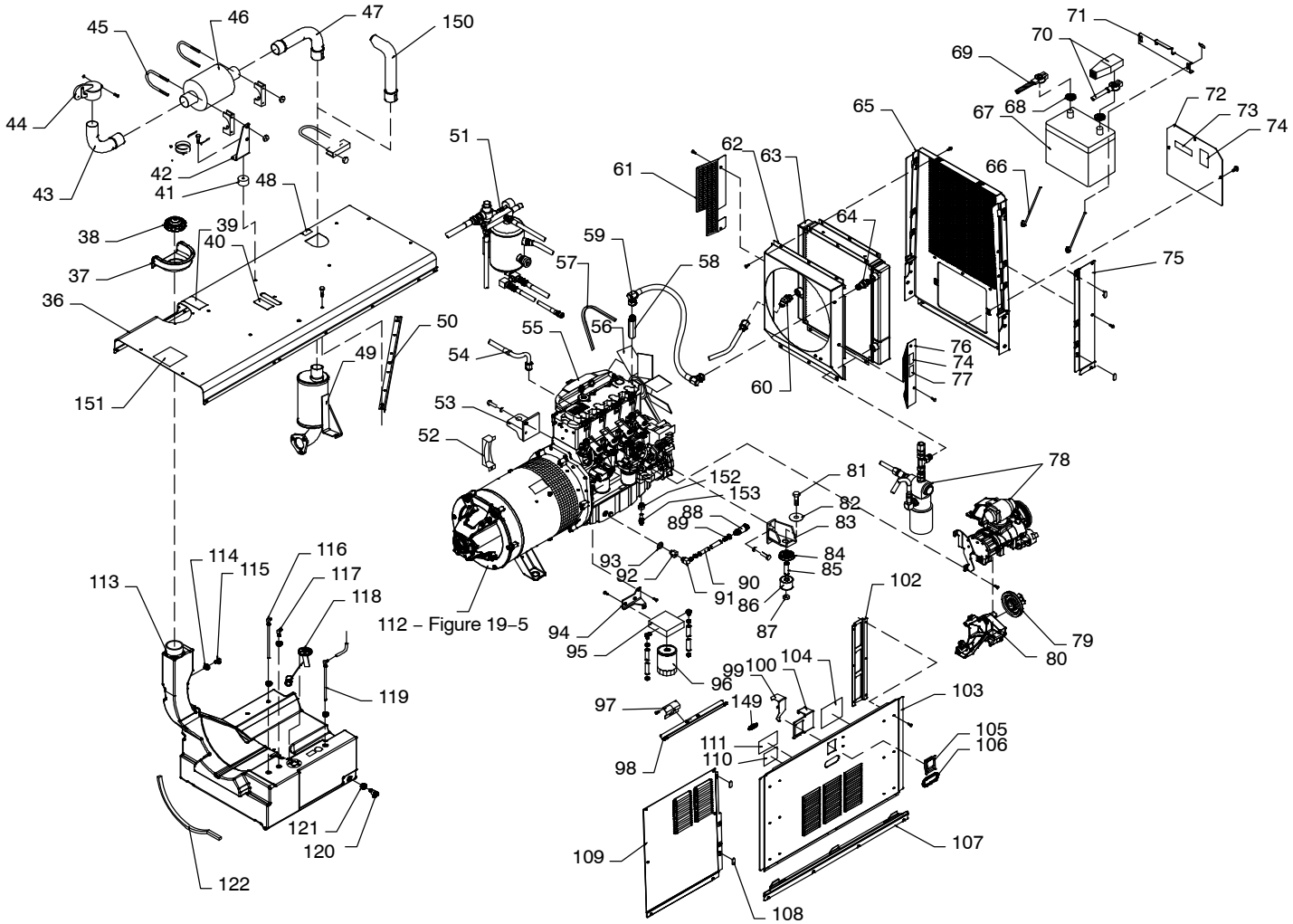


Figure 19-1. Main Assembly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112 – Figure 19–5
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803 324-G

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-1. Main Assembly

1		189824	Panel, Gen LH	1
2		189828	Panel, Engine Side	1
3		206601	Panel, Engine Extension LH	1
4	Z1	208277	Reactor, AC Environmental Rda	1
5	CR7	♦188636	Relay, OCV Control (Battery Charging)	1
6		♦081499	Bracket, Mtg Strip Terminal (Battery Charging)	1
7		038620	Link, Jumper Term Blk 30 Amp	1
	1T	189549	Block, Term Assy Standard W/Clamp (includes)	1
8		038621	. Block, Term 30 Amp 4 Pole Frict Term Str Both Side	1
9		081499	. Bracket, Mtg Strip Terminal	1
		138027	. Edge Trim, Style Tl750−b2x1/16 Black W/Clips 3.750	2
		020225	. Clamp, Nyl .875 Clamp Dia X.500 Wide .203 Mtg Hole	1
10	SR4, SR5	035704	Rectifier, Integ Bridge 40 Amp 800 V	2
11	CB4	045061	Circuit Breaker, Auto Reset 24vdc 7 Amp	1
12		206352	Brace, Front To Center Upright	2
13	T1	205636	Transformer, W/Brkt Environmental	1
14		201697	Pan, Reactor And Rectifier	1
15		173352	Extrusion, Rubber (order by ft.)	1
16		189708	Firewall, Top	1
17		194485	Hose, Air Cleaner	1
18		189764	Air Cleaner, Intake (Engine) (includes)	1
		*192938	. Filter, Air Element Primary	1
		*192939	. Filter, Air Element Safety	1
		206556	Pipe, Air Cleaner Intake Deutz (Turbo Hose To Air Cleaner Hose)	1
19		189763	Bracket, Mtg Air Cleaner	1
20		206351	Upright, Center Assy	1
21		189464	Seal, Weather Lift Eye	1
22		249657	Air Cleaner, Intake 5.250 In (Compressor) (includes)	1
23		249661	. Dust Ejector, Air Cleaner	1
		*197676	. Element, Air Cleaner	1
		*197679	. Element, Air Cleaner Safety	1
		249659	. Cover Assy, Air Cleaner	1
		249658	. Body, Air Cleaner	1
		249664	. Latch, Air Cleaner	1
24		197829	. Bracket, Mtg Air Cleaner	1
25		213144	Hose, Elbow Air Cleaner/Compressor	1
26			deleted	
27			deleted	
28		207268	Hose, Cwc Flexaust 2.000 Id X 22.000	1
29		+219140	Bracket, Mtg Air Cleaner	1
30		210151	Label, Air Cleaner Location	1
31		♦209612	Lever, Switch Lockout Disconnect Battery	1
32		♦209597	Bracket, Mtg Battery Disconnect Switch	1
33		♦209611	Switch, Disc Battery 2P 6−36 Volts	1
34		196220	Bracket, Holddown Fuel Tank Rear	1
35		192362	Bracket, Mtg Nyl 1/2 Conduit	1
36		+206603	Cover, Top	1
37		189052	Grommet, Plastic Neck Filler Fuel	1
38		190198	Cap, Tank Screw−on 3.500 In W/Vent W/Lanyard 8”	1
39		192041	Label, Use Diesel Fuel Only	1
40		222513	Label, Warning Falling Equipment Can Cause Serious	1
41		♦143915	Mount, Sgl Stud 1.5 Dia X 1.000 Lg .312−18 Stud	1
42		♦205702	Bracket, Mtg Spark Arrestor	1
43		♦205749	Pipe, Exhaust Elbow	1
44		♦603767	Cap, Weather Exhaust No. 3	1
45		♦010875	Clamp, Muffler 2.000 Dia U Pld	3
46		♦205712	Spark Arrestor	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-1. Main Assembly (Continued)

47		♦205748	Pipe, Exhaust Elbow	1
48		224265	Label, Warning Hot Exhaust Parts Do Not Touch	1
49		248464	Manifold, Exhaust Muffler Bf4m2011 Deutz	1
50		202633	Support, Cover E−coat	1
51		Figure 19-7	Air Compressor Assembly	1
52		191577	Guard, Starter Deutz	1
53		191809	Bracket, Mtg Engine LH	1
54		239507	Hose, Tubing Oil Assyw/Fittings 22.380lg	1
55		237005	Engine, Deutz Dsl Elec TD2011L04w (includes)	1
			EMR Module (Supplied with engine from Deutz)	1
		193256	Adapter, Engine Deutz	1
		195748	Flywheel, Deutz	1
		195745	Switch, Pressure Oil 1.5 Bar Nc Cont	1
		*067265	Oil Filter	1
		*066217	Secondary Fuel Filter	1
		208041	Spacer, Stl .323 Id X .625 Od X .141 Thk (Alternator)	1
		193230	Sender, Pressure Oil 0− 100 Psi	1
		194403	Adaptor, Oil Pressure Sender	1
	GLOW PLUG	190059	Glow Plug	1
		♦207847	Heater, Engine Block 120 Volts 300 Watts	1
56		207203	Fan, Engine Cooling 18.000 Suction	1
		208042	Spacer, Stl .800id X 1.188od X .090 Thk (Fan Hub Bolt)	1
57		*207808	Belt, V .375 X 45.125 Lg	1
58		239515	Extension, Hydraulic 37 Deg Flare	1
59		209633	Hose, Tubing Oil Assyw/Fittings 27.040lg	1
60		240354	Ftg, Stl Adapter 3/4 Sae−3/4 Jic 45 Deg	1
61		239504	Guard, Fan LH	1
62		239503	Shroud, Fan Air Pak	1
63		239501	Cooler, Oil Engine/Compressor	1
64		209623	Ftg, Brs Adapter Long 3/4 Sae−3/4 Jic	1
65		239502	Upright, Rear Radiator	1
66		201006	Bolt, J Stl .312−18 X 7.750 Pld	2
67	BATT	190897	Battery, Stor 12v 650 Crk 110 Rsv Gp 24 Maint Free	1
68		108081	Terminal Protector, Battery Post Mtg	2
69		190206	Cable, Bat Neg 42 In Lg 2 Awg W/Clamp & .375 Rng	1
70		190207	Cable, Bat Pos 45 In Lg No 1 Awg W/Clamp & .406 Rng	1
71		203430	Bracket, Battery Holddown	1
72		+201183	Cover, Battery Access	1
73		168385	Label, Warning Battery Explosion Can Blind	1
74		225120	Label, Warning Moving Parts Can Cause Injury	7
75		+206602	Panel, Engine Extension R.H.	1
76		239505	Guard, Fan RH	1
77		210229	Label, Compressor Oil Fill	1
78		Figure 19-7	Air Compressor Assembly	1
79		208024	Pulley, Fan Assy W/Bearings	1
80		206613	Bracket, Mtg Fan/Alternator	1
81		199849	Screw, 625−11x4.00 Hex Hd−pln Gr5 Pld	4
82		071731	Washer, Flat .656idx2.250odx.187t Stl Pld	4
83		191812	Bracket, Mtg Engine R.h.	1
84		071890	Retainer, Mount Eng/Gen	4
85		071730	Tubing, Stl .875 Od X12ga Wall X 2.500	4
86		083476	Mount, Eng/Gen Nprn .875id X 2.500od X 2.000 60 Dur	4
87		135205	Nut, 625−11 .94hex .77h Stl Pld Elastic Stop Nut	4

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-1. Main Assembly (Continued)

. . . . .		199505	. . Hose Assy, Oil Drain 32.000 Lg (includes)	1
. . . 88		165271	. . . . Valve, Oil Drain 3/8−18 Nptf	1
. . . 89		176529	. . . . Ftg, Hose Brs Barbed Fem 1/2 Tbg X 3/8 Npt	1
. . . 90		113854	. . . . Hose, Sae .500 Id X .780 Od Xcoil	2.666
. . . 91		176528	. . Ftg, Hose Brs Barbed Elbow M 1/2 Tbg X 1/2 Npt	1
. . . 92		173336	. . Ftg, Adapter Oil Drain	1
. . . 93		066298	. . Ring (Oil Drain)	1
. . . 94		239542	. . Bracket, Mtg Fuel Filter/Solenoid	1
. . . 95		232968	. . Base, Fuel Filter Assy	1
. . . 96		*192744	. . Filter, Fuel Spin−on	1
. . . . .		199383	. . Hose, Sae .312 Id X .560 Od X 8.000 (Fuel Filter To Fuel Pump)	1
. . . . .		191819	. . Hose, Sae .312 Id X .560 Od X 14.000 (Fuel Tank To Fuel Filter)	1
. . . 97		190992	. . Keeper, Latch Engine Access Door	1
. . . 98		206604	. . Channel, Stiffener Engine Access	1
. . . 99		209093	. . Bracket, Safety Latch	1
. . 100		209092	. . Bracket, Mtg Saftey Latch	1
. . 101			deleted	
. . 102		209090	. . Bracket, Stiffener Panel	2
. . 103		+209089	. . Panel, Engine Access Lift Off	1
. . 104		206464	. . Label, Maintenance Big Blue Air Pak Deutz Ce	1
. . 105		199592	. . Latch, Paddle Series 20 (Black)	1
. . 106		210681	. . Handle, Pocket Pull Door Access	1
. . 107		209091	. . Panel, Rocker Short	1
. . 108		191626	. . Bumper, Door Engine Access	4
. . 109		+189827	. . Panel, Gen Rh	1
. . 110		207448	. . Label, Maintenance I R Compressor	1
. . 111		209059	. . Label, Schematic Air System	1
. . 112	Figure 19-5		. . Generator Assembly	1
. . 113		218087	. . Tank, Fuel (includes)	1
. . 114		124253	. . . . Bushing, Tank Fuel	4
. . 115		189912	. . . . Ftg, Stl Barbed Elbow W/.047in Orifice Zinc Pld	1
. . 116		189909	. . . . Ftg, Stand Pipe Hose .250 X 9.265lg 90 Deg Zinc	1
. . 117		189913	. . . . Ftg, Stl Barbed Elbow Zinc Pld	1
. . 118		190142	. . . . Sender, Fuel Gauge 9.750 Deep Tank	1
. . 119		189910	. . . . Ftg, Stand Pipe Hose .3125 X 9.260lg 90 Deg Zinc	1
. . 120		189908	. . . . Valve, Drain Fuel 180 Deg Zinc Pld	1
. . 121		181572	. . . . Bushing, Tank Fuel	1
. . . . .		196219	. . Hose, Sae .250 Id X .500 Od X 26.000 (Fuel Return Line)	1
. . 122		191446	. . Extrusion, Rubber w/Adhesive 1.000 x 1.000 (order by ft.)	6ft
. . 123		209094	. . Bracket, Mtg Hose	1
. . 124		+212224	. . Base	1
. . 125		191897	. . Bracket, Mtg Unit	4
. . 126		224266	. . Label, Do Not Weld On Base	2
. . 127			Label, Manufacturing Rating (Order By Model And Serial No.)	1
. . 128		233953	. . Label, Warning General Precautionary CSA	2
. . 129	R3	189699	. . Resistor, WW Tap 375 W 10 Ohm W/Mtg Bkt	1
. . 130		218086	. . Bracket, Holddown Fuel Tank	1
. . 131	Figure 19-2		. . Control Box	1
. . 132		189731	. . Firewall, Bottom	1
. . 133		203260	. . Label, Caution Do Not Use Ether	1
. . 134		191448	. . Cover, Top Front Upright	1
. . 135		206609	. . Upright, Front	1
. . 136		+206606	. . Box, Valve Ball	1
. . 137		209682	. . Label, Air Power Ingersoll−Rand	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-1. Main Assembly

138		♦241432	Terminal, Pwr Output Red	1
139		+♦207095	Box, Battery Charge	1
140		♦241433	Terminal, Pwr Output Black	1
141		♦210156	Label, Battery Charge (Battery Charge +/–)	1
142		207096	Cover, Box Front Upright	1
143		209683	Label, Warning Safety Air System	1
144		Figure 19-3	Panel, Front w/components	1
145	CT1	202130	Xfmr, Current Sensing (Auto Idle)	1
146		Figure 19-6	Main Rectifier Assembly	1
147		193453	Bracket, Mtg Box Fcr	1
148	PC1	207397	Module, Field Current Regulator	1
149		085963	Spring, Ext .375 Od X .041 Wire X 2.000 (ForSafety Latch)	1
150		105734	Pipe, Muffler Extension Elbow 1.750 OD	1
151		233088	Label, Danger Using A Generator Indoors Can Kill You In Minutes	1
152		195746	Sender, Coolant Temp & 130c Switch	1
153		239641	Ftg, Adapter Oil Temperature Sender/Switch	1
		239704	Harness, Lead Extension	1
		049525	Nut, 312–18 U–nut Multi–thread	4
		049525	Nut, 312–18 U–nut Multi–thread	4
		238650	Label, Hour/Fuel Meter Usage	1
		206468	Kit, Label (Includes Safety And Informational Labels)	1
		♦195118	Kit, Lock-Out Vandalism (includes)	1
		♦209238	Door, Access Rh W/Om Pocket	1
		♦209240	Door, Access Lh	1
		♦209236	Tab, Lockout	1
		♦209241	Mount, Access Rh	1
		♦209242	Mount, Access Lh	1
		♦189975	Hinge, Door Access 180 Deg.	4
		♦155146	Sponge, Nprn .060 X 1.000 Wide X 4.000 Sce 41 Close	3

\+ When ordering a component originally displaying a precautionary label, the label should also be ordered.

* Recommended Spare Parts.

♦Optional

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

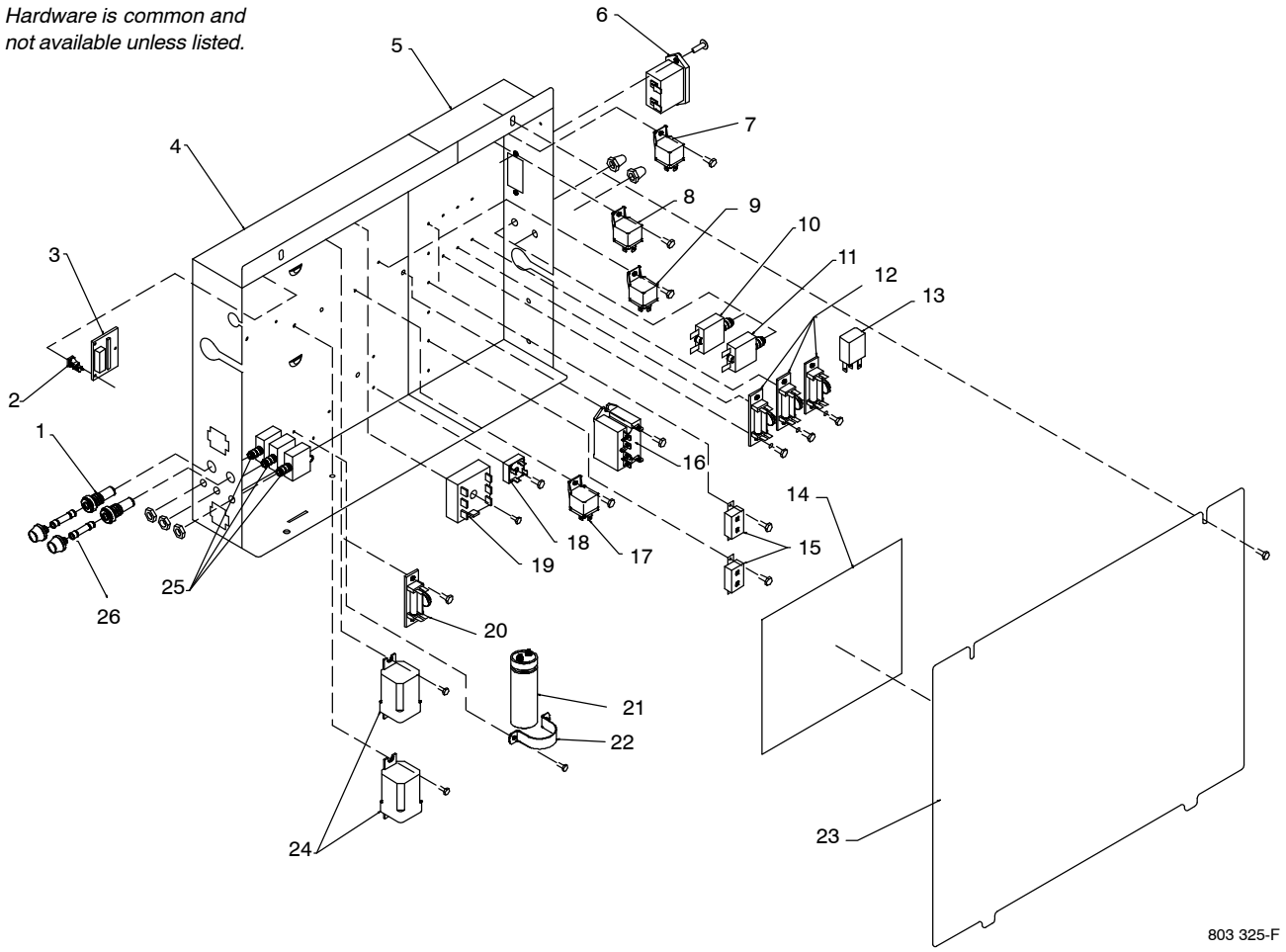

Figure 19-2. Control Box Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 19-2. Control Box Assembly – (Figure 19-1 Item 131)				
1		046432	Holder, Fuse Mintr .250 X 1.250 Panel Mtg	2
2		134201	Stand–off Support, Pc Card .312/.375w/Post&lock .43	3
3	PC9	192224	Circuit Card Assy, Display	1
4		201077	Control Box, LH	1
5		201078	Control Box, Rh	1
6	HM2	♦145247	Meter, Hour Air Compressor	1
7	CR3	173069	Relay, Encl 12vdc Spdt 30a/20a 5pin Flange Mtg	1
8	CR8	197325	Relay, Encl 12vdc Spst 70a 4pin Flange Mtg	1
9	CR6	090104	Relay, Encl 12vdc Spst 30a/15vdc 5pin Flange Mtg	2
10	CB15	083432	Supplementary Protector, Man Reset 1p 10a 250vac Frict	1
11	CB8	♦139266	Supplementary Protector, Man Reset 1p 15a 250vac Frict (Air Dryer)	1
12	C8/D8,C10/D10,D12	189701	Diode/Capacitor Board	3
13	CR1	252053	Relay, Encl 12vdc Spst 35a/14vdc 5 Pin	1
14		239512	Label, Layout Control Box	1
15	CB10,CB16	190374	Circuit Breaker, Auto Reset 12vdc 40 Amp	2
16	CR5	223710	Relay, Encl12vdc Dpst–no 25a 6pin Flange	1
17	CR14	♦090104	Relay, Encl 12vdc Spst 30a/15vdc 5pin Flange Mtg (Air Dryer)	1
18	SR1	035704	Rectifier, Integ Bridge 40. Amp 800v	1
19	PC7	195706	Module, Pull To Idle, Two Output, 7 Pin	1
20	C1/D1	189701	Diode/Capacitor Board	1
21	C9	087110	Capacitor, Elctlt 240 Uf 200 Vdc Can 1.39 Di	1
22		177136	Clamp, Capacitor 1.375 Dia	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-2. Control Box Assembly (Continued)

23		201079	Cover, Control Box	1
24	CR4, CR10	113247	Relay, Encl 12vdc Dpdt 20a/120vac 8pin Flange Mtg	2
25	CB11,CB12,CB13	139266	Supplementary Protector, Man Reset 1p 15a 250vac Frict	3
26	F1, F2	085874	Fuse, Mintr Cer Slo−blo 10. Amp 250 Volt	2
		242629	Harness, Engine Deutz TD2011L04w (includes)	1
		083432	Supplementary Pro, Man Reset 1p 10a 250vac Frict	1
	S2	021467	Switch, Tgl Spst 3a 250v Off−none−(On) Spd Term (Located on front panel)	1
		177859	Conn, Body 5 Terminal	1
		113247	Relay, Encl 12vdc Dpdt 20a/120vac 8pin Flange Mtg	2
		150316	Conn, Rect Univ 039 6p/S 3row Plug Cable Lkg	4
	S10	206624	Switch, Tgl Sptt 6a 125vac (On)−on−(On)Spd Term (Located on front panel)	1
		189701	Diode/Capacitor Board,	3
		214932	Conn, Rect Univ 039 8p/S 2row Plug Cable Lkg Seal	1
		214933	Seal, Wire Univ 039	8
		190374	Circuit Breaker, Auto Reset 12vdc 40 Amp	2
		156734	Nut, 010−32 .31hex .13h Stl Pld Sem Cone Wshr.38d	4
		214876	Relay, Encl 6vdc Spst 35a/14vdc 5 Pin	1
		139266	Supplementary Protector, Man Reset 1p 15a 250vac	1
		197325	Relay, Encl 12vdc Spst 70a 4pin Flange Mtg	1
		148850	Socket, Relay 5 Pin	2
		240075	Connector, Housing Splash Proof 90 Vers	1
		240076	Connector, Housing Cover	1
		240074	Seal, Plug Single Wire (5mm Hole)	7
		240071	Plug, Cavity 2,5mm For 5,4mm Dia.	18
		240098	Connector, Housing	1
		240099	Cap, Plug	1
		240100	Clamp, Cable	1
		240077	Connector, Housing 2p Junior−timer Geh	1
		215192	Conn, Rect 2p Boot	1
		240104	Connector, Housing	1
		240074	Seal, Plug Single Wire (5mm Hole)	2
		240081	Connector, Rnd 7p 1.5mm Bu−ste Kpl	1
		240082	Strain Relief, 90grd Abdeckkappe	1
		240074	Seal, Plug Single Wire (5mm Hole)	5
		240071	Plug, Cavity 2,5mm For 5,4mm Dia.	2
		240442	Connector, Housing Junior Timer	1
		240076	Connector, Housing Cover	1
		240074	Seal, Plug Single Wire (5mm Hole)	9
		240071	Plug, Cavity 2,5mm For 5,4mm Dia.	16
		164617	Clip, Wiring Straight	2
		219873	Harness, Control Box, Weld Control LH (includes)	1
	RC3	158466	Conn, Rect Univ 084 12p/S 3row Rcpt Cable/Panel Lkg	1
	RC1	135133	Conn, Rect Univ 084 9p/S 3row Rcpt Cable/Panel Lkg	1
		204737	Cable Tie Mount, Winged Push	3
	CR15	♦172015	Time Delay Relay (Air Dryer)	1

♦Optional

*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

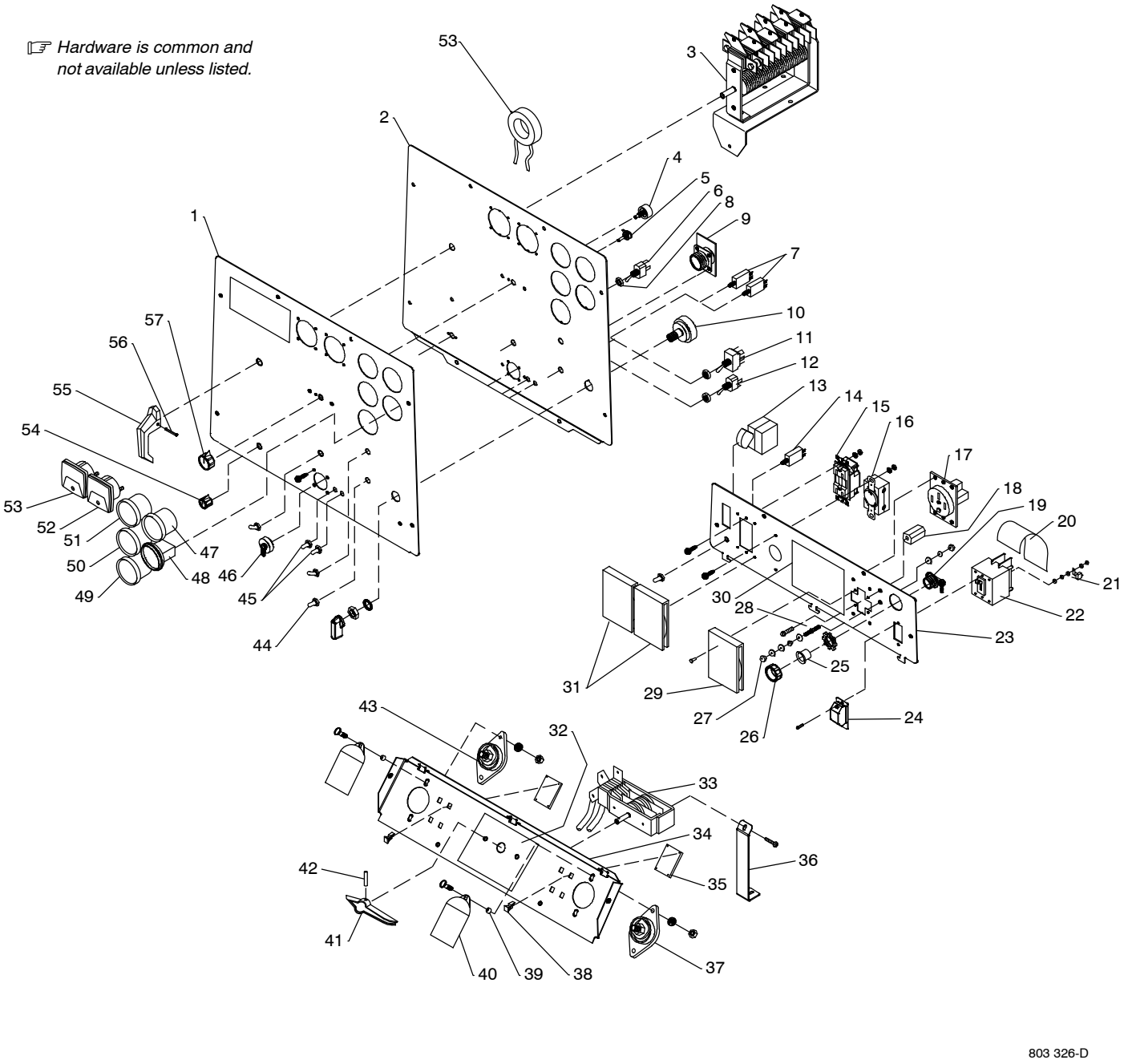

Figure 19-3. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 19-3. Panel, Front w/Components (Figure 19-1 Item 144)				
1		239125	Plate, Screened Ident Control Rating	1
2		238616	Panel, Engine/Weld Control	1
3	S3	208278	Switch, Range/Changeover	1
		192558	Harness, Range Switch (includes)	1
	RC6	148389	Conn, Rect Univ 084 4p/S 1row Rcpt Cable/Panel Lkg	1
4	R1	193118	Pot, Cp Flat 1t 2. W 1k Ohm Linear	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 19-3. Panel, Front w/Components (Continued)	
		206809	Harness, Weld Control (includes)	1
5	S6	193234	Switch, Rotary 6 Position Gold Contacts	1
		197257	Guard, Circuit Breaker (For S6 – Not Included w/Harness)	1
6	S5	011609	Switch, Tgl Spdt 15a 125vac On–none–on Spd Term Chr	1
	PLG9	193183	Conn, Rect Cinch 18 Pin	1
		196603	Seal, Switch 6 Position Rotary .250 Shaft	1
	PLG14	141450	Conn, Rect Metrmate 10skt 1row Plug Cable Lkg	1
		164617	Clip,Wiring Straight	2
	PLG10	150316	Conn, Rect Univ 039 6p/S 3row Plug Cable Lkg	1
7	CB5	139266	Supplementary Protector, Man Reset 1p 15a 250vac Frict	1
	CB6	139266	Supplementary Protector, Man Reset 1p 15a 250vac Frict	1
8		202209	Spacer, Nylon .221 Thk	2
9	PC6	192995	Circuit Card Assy, Connector/Receptacle	1
10	S1	217680	Switch, Ignition 4 Position W/Out Handle	1
		207073	Lever, Ignition Switch	1
		201244	Washer, tooth.728idx1.166odx.050t stl pld int.688	1
11	S10	206624	Switch, Tgl Sptt 6a 125vac (On)–on–(On) Spd Term (Included In Engine Wiring Harness, See Figure Figure 19-2)	1
12	S2	021467	Switch,Tgl Spst 3a 250v Off–none–(On) Spd Term (Included In Engine Wiring Harness, See Figure Figure 19-2)	1
		Figure 19-4	Auxiliary Power Group , Export	
		215 437	Auxiliary Power Group, Domestic (Includes)	
13	CB1	201083	Supplementary Protector, Man Reset 2p 20a 250vac	1
		201553	Clip, Retaining Circuit Breaker	1
		201109	Harness, Receptacle Auxillary Power (includes)	1
14	CB2	093996	Supplementary Protector, Man Reset 1p 20a 250vac Frict	1
15	GFCI1	246865	Rcpt, Str Dx Grd 2p3w 20a 125v *5–20r Gfi	1
16	RC1	147632	Rcpt,Tw Lk Grd 2p3w 30a 250v *L6–30r	1
		010146	Clamp, Nyl .625 Clamp Dia X.500 Wide .203 Mtg Hole	2
17	RC5	♦182954	Rcpt, Str 3p4w 50a 125/250v	1
18		♦025248	Stand-off, Insul .250-20 X 1.2	1
19		♦604102	Connector, Clamp Cable 1.000	1
20		♦197527	Guard, Circuit Breaker	1
21		♦197363	Terminal, Ring Tng Screw Clamp	3
22	CB7	♦214926	Supplementary Protector, Man Reset 3p 50a 250vac	1
23		+215347	Panel, Power	1
		+♦215363	Panel, Generator Power (Full KVA Option)	1
	CT2	♦197433	Transformer, Current Sensing	1
24		♦214927	Boot, Circuit Breaker 1 Pole	1
25		♦197508	Plug, Protective	1
26		♦077440	Bushing, Conduit 1 In	1
27		601836	Nut, 250–20 .50hex .19h Brs	3
		010915	Washer, Flat .257idx0.640odx.031t Brs	4
		163167	Washer, Lock .254idx0.489odx.062t Sst Split.250	2
28	GRD	083030	Stud, Brs .250–20 X 1.750 W/Hex Collar	1
29		♦209056	Cover, Receptacle W/Gasket	1
30		190861	Label, Warning Electric Shock And Moving Parts Etc	1
		♦197399	Label, Warning 3 Ph Generator Power	1
31		209056	Cover, Receptacle 2.250 Dia. Lexan	2
32		♦210149	Label, Battery Charge (Switch Position)	1
		♦	Label, Polarity/AC Switch Position	1
33	S12	♦220491	Switch, Polarity/AC	1
	S13	♦210217	Switch, Battery Charge Assy	1
34		201125	Panel, Mtg Terminal Power Output	1
35	PC4, PC5	189744	Circuit Card Assembly, HF	2
36		♦210206	Bracket, Support Switch	1
37		241433	Terminal, Pwr Output Black	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-3. Panel, Front w/Components (Continued)

		180735	Washer, Output Stud	2
38		134201	Stand−off Support, Pc Card .312/.375w/Post&lock .43	8
39		181169	Spacer, Output Stud	2
40		186621	Boot, Generic Output Stud	2
41		♦059773	Switch, Handle (Polarity/AC Switch)	1
42		♦010647	Pin (Polarity/AC Switch)	1
		♦059773	Handle, Switch (Battery Charging)	1
		♦010647	Pin,Spring Cs .156 X 1.250 (Battery Charging)	1
		♦081499	Bracket, Mtg Strip Terminal (Battery Charging)	1
43		241432	Terminal, Pwr Output Red	1
44		021385	Boot, Toggle Switch Lever	1
45		190323	Boot, Circuit Breaker Clear Hex Nut	4
46		170391	Conn, Circ Ms Protective Cap Size 20 Nylon	1
47	FUEL/HM	232112	Gauge, Fuel Elec/Hour Meter	1
48	BAT	193228	Meter, Volt DC 8 − 18 Scale 2.250 In Black Face	1
49	AIR	206599	Gauge, Pressure 0−200 Psi Electric Switch	1
50	TEMP	217084	Gauge, Engine Temperature	1
51	OIL	217083	Gauge, Engine Oil Pressure	1
52	A1	♦164873	Meter, Amp AC/DC 0− 500 0−600 Dc Scale 2.5 In	1
	CT3	♦209274	Xfmr, Current (Meters)	1
53	V1	♦164874	Meter, Volt AC/DC 0− 100 Scale 2.5 In	1
54		097922	Knob, Pointer .875 Dia X .250 Id W/Set Screwsplstc	1
55		189161	Handle, Switch Range	1
56		010647	Pin, Spring Cs .156 X 1.250	1
57		097924	Knob, Pointer 1.625 Dia X .250 Id W/Set Screwsplstc	1
		072590	Lock, Shaft Pot .375−32 X .250 Dia Shaft Tall	1
		215207	Harness, Unit Weld Control − CV (includes)	1
	PLG6	114063	Conn, Rect Univ 084 4p/S 1row Plug Cable Lkg	1
	PLG8	193184	Conn, Rect Cinch 30 Pin	1
		147992	Conn, Rect Univ 039 10p/S 2row Plug Cable Lkg	1
	PLG13	158465	Conn, Rect Univ 084 12p/S 3row Plug Cable Lkg	1
		088731	Bushing, Snap−in Nyl .375 Id X .500 Mtg Hole	1
		135873	Clip, Conduit Convoluted 1/2 In 6.35mm Mtg Hole	3
		187654	Seal, Wire Univ 12p/S 3row	1
		196602	Plug, Cavity 18,30 Position Cinch Connector	7
		059712	Clip, Component .437 Dia Mtg Adh Back	1
		024103	Blank, Snap−in Nyl .750 Mtg Hole Black	1
		120304	Blank, Snap−in Nyl .250 Mtg Hole Black	2
		025234	Plug, Str Grd 2p3w 15a 250v *6−15p	1

♦Optional

\+ When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

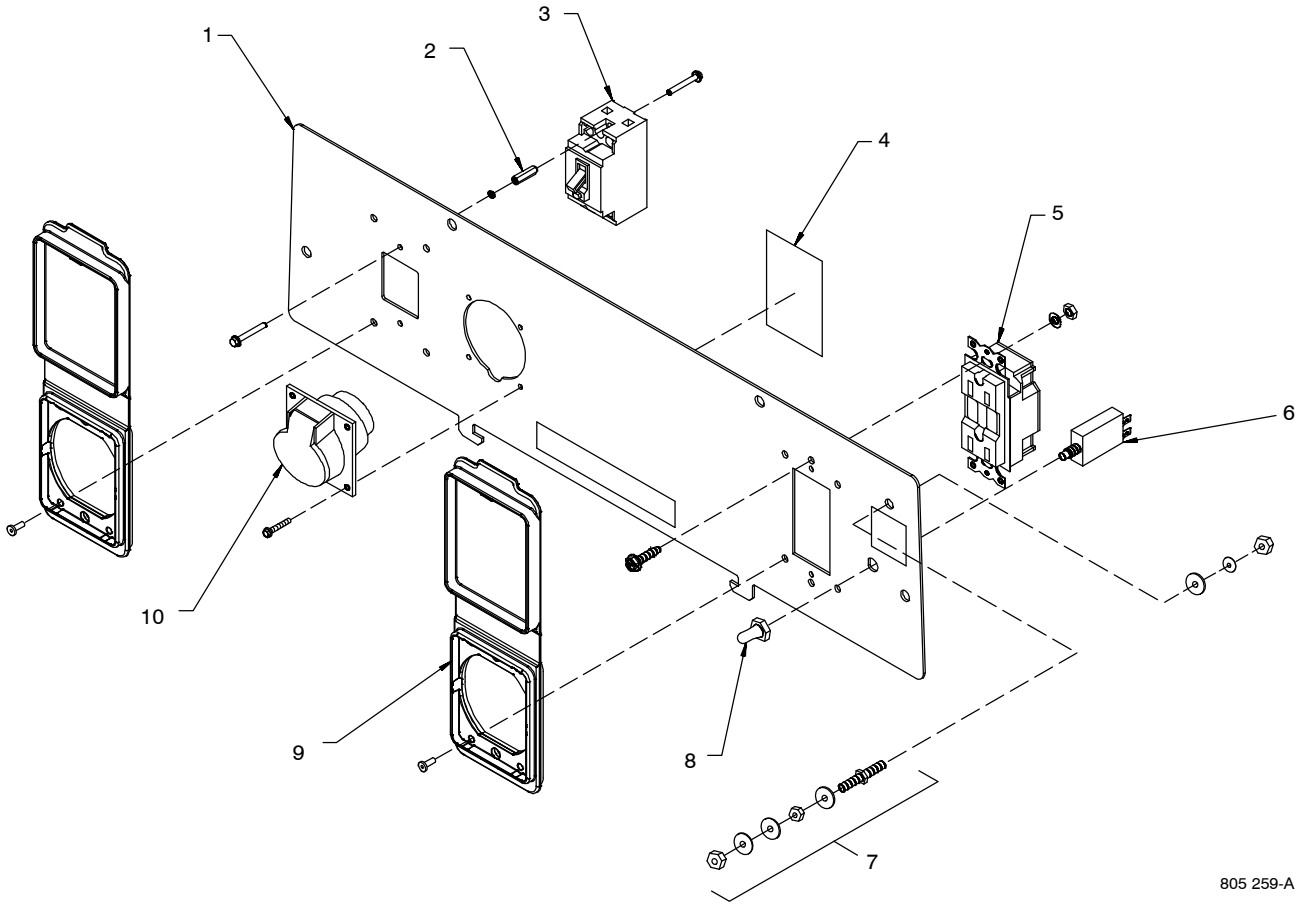

Figure 19-4. Auxiliary Power Group, Export

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
1		+223121	Panel, Aux Power (Export)	1
2		144844	Stand−off, No 6−32 X .875 Lg .250 Hex Al Fem	2
3	ELCB1	222991	Circuit Breaker, Elcb 16a 220v 0.030a Trip	1
4		200910	Label, Warning Electric Shock And Moving Parts Ce	1
		223132	Harness, Receptacle Auxillary Power W/Elcb (includes)	
5	GFCI1	246865	Rcpt, Str Dx Grd 2p3w 20a 125v *5−20r Gfi	1
6	CB2	093996	Circuit Breaker, Man Reset 1p 20a 250vac Frict	1
7		083030	Stud, Brs .250−20 X 1.750 W/Hex Collar	1
		601836	Nut, 250−20 .50hex .19h Brs	3
8		190323	Boot, Circuit Breaker Clear Hex Nut	1
9		209056	Cover, Receptacle W/Gasket	2
10	RC1	176355	Rcpt, Str 2p3w 16a 220v Flange Mtg	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

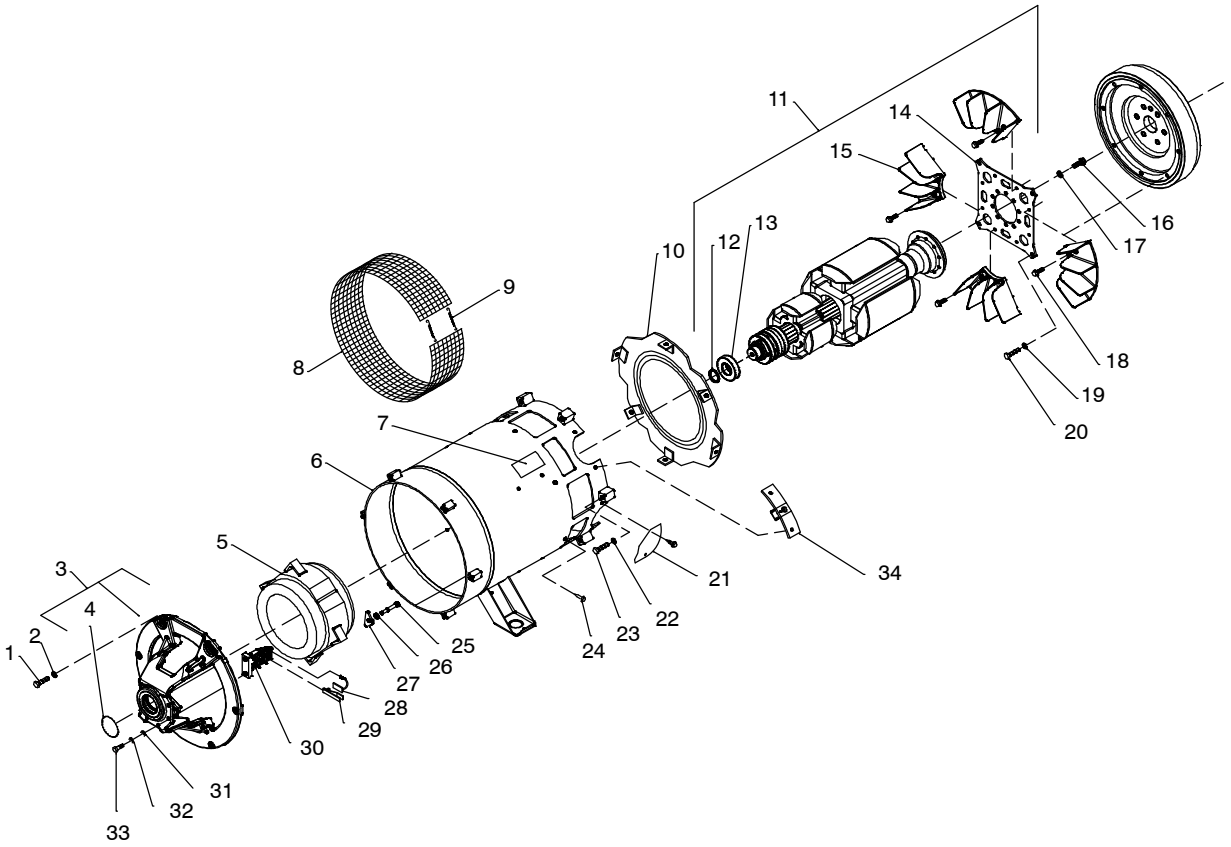

Figure 19-5. Generator

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 19-5. Generator (Figure 19-1 Item 112)	
1		132053	Screw, 375−16x1.50 Hex Hd−pln Gr5 Pld	6
2		183387	Washer, Cone .380idx .860odx.109t Stl Pld 4000lbs	6
3		203635	Endbell, Gen	1
4		143220	O-Ring 2.859 ID X .139 Cs 70 Duro Viton	1
5	AUX STATOR	201099	Stator, Exciter/Aux Power	1
6	STATOR	+254088	Stator, Weld Assy Complete	1
	STATOR	+♦209220	Stator, Weld Assy Complete (3-Phase Generator Option)	1
7		225120	Label, Warning Moving Parts Can Cause Serious	1
8		190197	Guard, Generator Wire Mesh	1
9		172674	Spring, Ext .240 Od X .041 Wire X 3.500 Pld	2
10		039207	Baffle, Air Gen	1
11	ROTOR	251855	Rotor, Generator Segmented Assy (Includes)	1
		251856	Rotor, Generator (Includes)	
12		024617	Ring, Rtng Ext 1.375 Shaft X .050 Thk	1
13		053390	Bearing, Ball Rdl Sgl Row 1.370 X 2.830 X .6	1
		210447	Fan, Rotor Assy Generator (Segmented) (includes)	1
			Hub, Drive (Not Sold Separately)	1
14		210332	Plate, Flex Hubmount	1
15		206242	Fan, Rotor Segmented Assy Gen	4
16		049026	Screw, M10−1.5x 25 Hex Hd−pln 8.8 Pln	10
17		083883	Washer, Lock .402idx0.709odx.087t Stl Split10mm	10
18		080389	Screw, 312−18x1.00 Hexwhd.66d Stl Pld Slffmg Tap−rw	8
19		083883	Washer, Lock .402idx0.709odx.087t Stl Split10mm	4
20		049026	Screw, M10−1.5x 25 Hex Hd−pln 8.8 Pln	4
21		191579	Cover, Starter Hole	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-5. Generator (Continued)

. . . 22		083883 . .	Washer, Lock .402idx0.709odx.087t Stl Split10mm	6
. . . 23		172555 . .	Screw, M10−1.5x 50 Hex Hd−pln 8.8 Pld	6
. . . 24		602159 . .	Screw, 312−18x .75 Hexwhd.66d Stl Pld Slffmg Tap−rw	6
. . . 25		604950 . .	Screw, 312−18x2.00 Hex Hd−pln Gr5 Pld	4
. . . 26		602211 . .	Washer, Lock .318idx0.586odx.078t Stl Pld Split.312	4
. . . 27		139341 . .	Washer, Exciter	4
. . . 28		*190823 . .	Brush, Contact Elect .250 X.500 X 1.250 Grd Ay	3
. . . 29		188560 . .	Clip, Spring	3
. . . 30		189142 . .	Brushholder, Generator	1
. . . 31		602242 . .	Washer, Flat .375idx0.875odx.083t Stl Pld	2
. . . 32		602211 . .	Washer, Lock .318idx0.586odx.078t Stl Pld Split.312	2
. . . 33		604534 . .	Screw, 312−18x1.25 Hex Hd−pln Gr5 Pld	2
. . . 34		239759 . .	Bracket, Mounting Magnetic Pickup Assy	1

+ When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

♦Optional

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

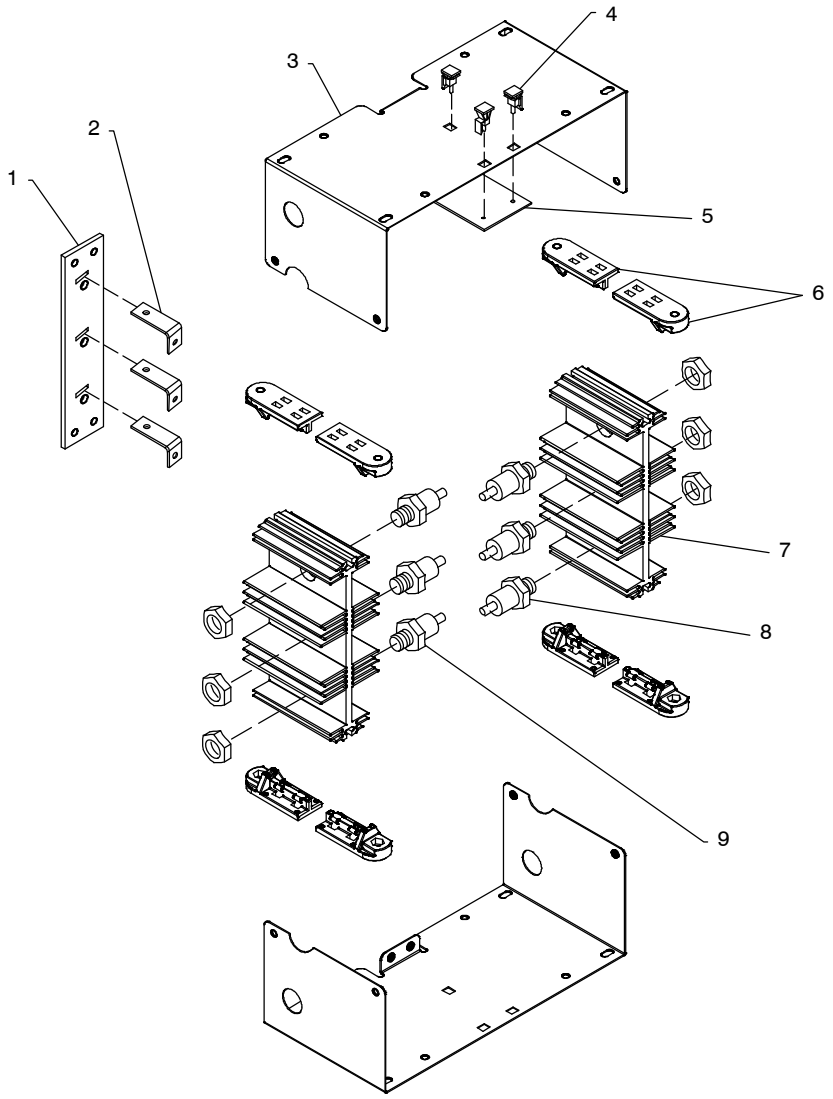

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Figure 19-6. Main Rectifier Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 19-6. Main Rectifier Assembly (Figure 19-1 Item 146)	
.....	SR3	239784 ..	Rectifier, environmental high power (includes)	1
... 1	.....	188137	Connection Board, Rectifier Ac	1
... 2	.....	188517	Bus Bar, Conn Bd	3
... 3	.....	188135	Enclosure, Rectifier	2
... 4	.....	134201	Stand−off Support, Pc Card .312/.375w/Post&lock .43	3
... 5	PC3	215755	Circuit Card Assy, Protection	1
... 6	.....	188136	Insulator, Heatsink	8
... 7	.....	188493	Heat Sink, Rectifier Al	2
... 8 .	D3, D5, D7 .	245097	Diode, Rect 300 A 500v Do−9 (Straight) Modified	3
... 9 .	D2, D4, D6 .	245096	Diode, Rect 300 A 500v Do−9 (Reverse) Modified	3

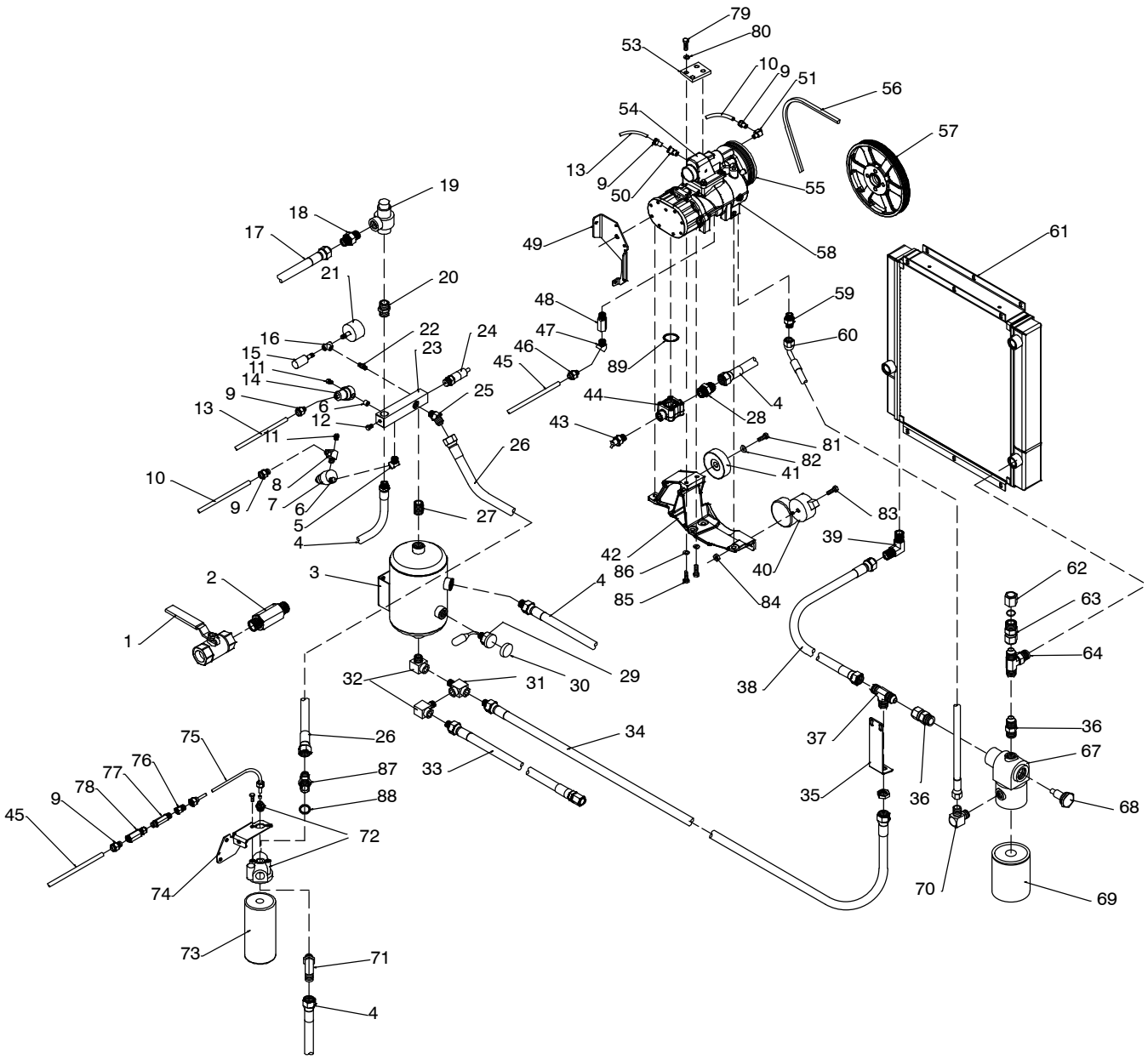
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		213 127	**Air Dryer Kit (Rear Panel Mount) (Optional)**	
		209174	.. Dryer, Kit Air T−2000 Twin Tower	1
		118132	.. Ftg, Pipe Stl Nipple Hex 3/4 Npt	1
		209457	.. Ftg, Pipe Stl Elbow St 3/4 Npt	1
		232957	.. Ftg, Flrd Stl Tube End/Female Pipe End 3/4	1
		167788	.. Nut, .375-16 .56 Hex .34H Stl P	2
		153403	.. Bushing, Snap−in Nyl .750 Id X 1.000 Mtg Hole Cent	1
		209460	.. Tubing, Corrugated Plastic Slit .250 Dia X 16.000	2
	★CR14	090104	.. Relay, Encl 12vdc Spst 30a/15vdc 5pin Flange Mtg	1
	★CB8	139266	.. Supplementary Protector, Man Reset 1p 15a 250vac	1
		190323	.. Boot, Circuit Breaker Clear Hex Nut	1
		128237	.. Screw, 010−32x .50 Hexwhd.40d Stl Pld Slffmg Tap−rw	1
		213132	.. Hose, Tubing Oil Assy (Includes)	1
		232964	.... Hose, Tubing Oil Assy W/Fittings	1
		213101	.... Hose, Tubing Oil Assy W/Fittings 35.000lg	1
		213118	.... Ftg, Stl Tube Union Jic−23j	1
		119148	.. Bushing, Snap−in Nyl 1.968 Id X 2.500 Mtg Hole	1
		209768	.. Ftg, Flrd Stl Conn M 3/4 Npt−jic	1
		191914	.. Screw,375−16x1.00 Hexwhd.66d Stl Pld Slffmg	2
	★CR15	172015	.. Time Delay Relay	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

★ Shown in Figure 19-2

☞ *Hardware is common and not available unless listed.*



Ref: 803 328–H

Figure 19-7. Air Compressor Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 19-7. Air Compressor Assembly (Figure 19-1 Items 51 & 78)

1		206607	Valve, Ball	1
2		210523	Ftg, Flrd Stl Tube End/Female Pipe End 3/4	1
3		206939	Tank, Oil Separator	1
4		210248	Hose Assy, Air W/Fittings 3/4 X 35.250 Lg	2
5		084999	Ftg, Pipe Brs Elbow St 45 1/4 Npt	1
6		117826	Ftg, Pipe Brs Nipple Close 1/4 Npt	2
7		210053	Valve, Pressure Regulator	1
8		071270	Ftg, Pipe Brs Tee St 1/4 Npt 071 269	1
9		209854	Ftg, Pipe Adapter M 1/4 Npt X 1/4 Line	4
10		218602	Hose, Nylon Blue 44.000lg	1
11		210040	Orifice/Muffler,120	2
12		151662	Ftg, Pipe Brs Plug Hex .125 Npt	1
13		218601	Hose, Nylon Red 36.000lg	1
14		210054	Valve, Automatic Blowdown	1
15		206746	Switch, Pressure 20psi Nc	1
16		602965	Ftg, Pipe Brs Tee 1/8 Npt	1
17		209635	Hose, Assy w/Fittings 42.360lg	1
18		209621	Ftg, Stl Adapter 3/4 Sae−3/4 Jic	1
19		210051	Valve, Check Minimum Pressure	1
20		209767	Ftg, Pipe Stl Connector M 3/4 Sae−npt Adapter	1
21		206615	Sender, Pressure Oil 0− 200 Psi	1
22		073655	Ftg, Pipe Brs Nipple Hex 1/8 Npt	1
23		206937	Manifold, Air	1
24		206743	Valve, Safety Relief 150psi	1
25		209754	Ftg, Pipe Stl Elbow M 45dg 3/4 X (Npt−jic 45dg)	1
26		214685	Hose Assy, Air W/Fittings 3/4 X 21.750 Lg	1
27		209787	Ftg, Pipe Stl Nipple Close 3/4 Npt	2
28		209621	Fitting, Stl Adapter 3/4 SAE − 3/4 JIC	1
29		210058	Gauge, Oil Level Assembly	1
30		247624	Pointer Assembly,	1
31		209766	Ftg, Pipe Stl Tee Street 3/4 Npt M−f−f	1
32		209457	Ftg, Pipe Stl Elbow St 3/4 Npt	2
33		209638	Hose, Oil W/Fittings 25.670 Lg	1
34		209639	Hose, Oil W/Fittings 26.320 Lg	1
35		243795	Bracket, Mtg Tubing	1
36		210251	Ftg, Stl Swivel Straight Thread Conn 3/4 O−ring	2
37		210252	Ftg, Stl Bulkhead Branch Tee 3/4 Flare Tube End	1
38		210250	Hose Assy, Oil W/Fittings 3/4 X 15.500 Lg	1
39		209765	Ftg, Pipe Stl Elbow Adapter 90dg 3/4 Sae−jic−	1
40		208040	Tensioner,Belt w/Pully	1
41		208428	Idler Pulley	1
42		225038	Bracket, Mtg Compressor	1
43		206742	Switch, High Air Temperature 248f Nc	1
		210022	O−ring, High Air Temp Switch	1
44		211904	Manifold, Compressor	1
		218558	Screw, M 8−1.2x 50 Hex Hd−pln 8.8 Pld (Manifold Mtg.Screws)	4
45		209641	Hose, Nylon White 32.000lg	1
46		209855	Ftg, Pipe Stl Adapter M 1/8 Npt X 1/4 Line	2
47		015732	Ftg, Pipe Brs Elbow St 45 1/8 Npt	1
48		209852	Ftg, Pipe Stl Adapter M M10 X 1/8 Npt F	1
49		239500	Brace, Compressor	1
50		084999	Ftg, Pipe Brs Elbow St 45 1/4 NPT	1
51		176518	Ftg, Pipe Brs Elbow St 1/4 Npt	1
52			Deleted	

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 19-7. Air Compressor Assembly (Continued)	
53		206698	Plate, Mtg Compressor To Bracket	1
54		218305	Valve, Inlet Unloader 90dg	1
		210016	Gasket, Unloader Valve	1
55	CLUTCH	210055	Clutch, Electro Magnetic 12vdc W/5.75 Dia Pulley	1
		234356	Screw, M 6-1.0x 40 Soc Hd-hex 12.9 Pln	1
56		218609	Belt, Micro V 21mm X 1485mm	1
57		206800	Pulley, Crankshaft	1
58		210001	Airend, Gear–driven W/Tapered Input Shaft	1
		258419	Kit, Compressor Front Seal	
59		209853	Ftg, Pipe Stl Adapter M M16 1.5 X 1/2 Jic	1
60		243794	Hose, Tubing Oil Assyw/Fittings 16.720 Lg	1
61		206558	Cooler, Oil Engine/Compressor	1
62		209851	Ftg, Pipe Stl Tube End Cap 3/4 0rfs	1
63		209825	Ftg, Stl Adapter Swivel 12m X Jic–12 F	1
64		209764	Ftg, Pipe Stl Tee Branch Sae–12 X Jic–12	1
65			Deleted	
66			Deleted	
67		210052	Valve,Oil Temperature Control	1
68		206744	Thermostat, 170f (w/gasket)	1
69		206745	Filter, Oil	1
70		209756	Ftg, Pipe Stl Elbow M 90dg 1/2 Jic X 3/4 Sae	1
71		214686	Ftg, Pipe Stl Elbow 90dg 3/4bspt M X 3/4 Jic M	1
72		220326	Head, Spin On Separator	1
73		206747	Separator, Oil/Air Filter	1
74		208029	Bracket, Mtg Filter Base	1
75		209646	Tubing, Ssstl .312 Od X.028 W/Ftgs	1
76		209856	Ftg, Stl Adapter Tube End Reducer 04f X 05m	1
77		210027	Valve, Check/Scavenge Orifice/Screen	1
78		209755	Ftg, Pipe Stl Swivel F 1/4 Npt X 1/4 F Jic	1
		*210056	Oil, Compressor 1gal	1
79		044772	Screw, M12–1.7x 30 Hex Hd–pln 8.8 Pln	6
80		602216	Washer, Lock .502idx0.879odx.151t Stl Pld Split.500	6
81		198447	Screw, M10–1.5x 20 Hex Hd–pln 8.8 Pln	1
82		602243	Washer, Flat .438idx1.000odx.083t Stl Pld	1
83		208425	Screw, M10–1.5x 60 Hex Hd–pln 8.8 Pld Din 931	1
84		198631	Nut, M10 Hex Lock Nut Stl Pld	1
85		208426	Screw, M12–1.75x 40 Hex Hd 12pt Flange Screw 12.9	2
86		602216	Washer, Lock .502idx0.879odx.151t Stl Pld Split.500	2
87		214687	Ftg, Pipe Stl 3/4bspp X 3/4 Jic M	1
88		214920	Seal, Ring Bonded Rbr/Stl .950 Id X 1.380 Od X .100	1
89		218423	O-Ring	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Warranty Questions?

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Your distributor also gives you ...

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You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

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Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller

TRUE BLUE® WARRANTY

Effective January 1, 2012
(Equipment with a serial number preface of MC or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original Main Power Rectifiers Only to Include SCRs, Diodes, and Discrete Rectifier Modules
2. 3 Years — Parts and Labor
   * Engine Driven Welding Generators **(NOTE: Engines are Warranted Separately by the Engine Manufacturer.)**
   * Inverter Power Sources (Unless Otherwise Stated)
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
   * Transformer/Rectifier Power Sources
   * Water Coolant Systems (Integrated)
3. 2 Years — Parts
   * Auto-Darkening Helmet Lenses (No Labor)
4. 1 Year — Parts and Labor Unless Specified
   * Automatic Motion Devices
   * CoolBelt and CoolBand Blower Unit (No Labor)
   * External Monitoring Equipment and Sensors
   * Field Options (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * RFCS Foot Controls (Except RFCS-RJ45)
   * Fume Extractors
   * HF Units
   * ICE/XT Plasma Cutting Torches (No Labor)
   * Induction Heating Power Sources, Coolers **(NOTE: Digital Recorders are Warranted Separately by the Manufacturer.)**
   * Load Banks
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * PAPR Blower Unit (No Labor)
   * Positioners and Controllers
   * Racks
   * Running Gear/Trailers
   * Spot Welders
   * Subarc Wire Drive Assemblies
   * Water Coolant Systems (Non-Integrated)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Wireless Remote Foot/Hand Controls and Receivers
   * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
   * Batteries
   * Bernard Guns (No Labor)
   * Tregaskiss Guns (No Labor)
6. 90 Days — Parts
   * Accessory (Kits)
   * Canvas Covers
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * M-Guns
   * MIG Guns and Subarc (SAW) Guns
   * Remote Controls and RFCS-RJ45
   * Replacement Parts (No labor)
   * Roughneck Guns
   * Spoolmate Spoolguns

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

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Owner's Record

Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip

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Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables Options and Accessories Personal Safety Equipment Service and Repair Replacement Parts Training (Schools, Videos, Books) Technical Manuals (Servicing Information and Parts) Circuit Diagrams Welding Process Handbooks To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller
Contact the Delivering Carrier to:	File a claim for loss or damage during shipment. For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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